1997

Revised

EV1™

SIR

Service Manual

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CAUTION

To reduce the chance of personal injury and/or property damage, the following instructions must be carefully observed.

Proper service and repair are important to the safety of the service technician and the safe, reliable operation of all motor vehicles. If part replacement is necessary, the part must be replaced with one of the same part number or with an equivalent part. Do not use a replacement part of lesser quality.

The service procedures recommended and described in this service manual are effective methods of performing service and repair. Some of these procedures require the use of tools specifically designed for the purpose.

Accordingly, anyone who intends to use a replacement part, service procedure, or tool that is not recommended by the vehicle manufacturer must first determine that neither his safety nor the safe operation of the vehicle will be jeopardized by the replacement part, service procedure, or tool selected.

It is important to note that this manual contains various "Cautions" and "Notices" that must be carefully observed in order to reduce the risk of personal injury during service or repair or the possibility that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that these "Cautions" and "Notices" are not exhaustive; it is impossible to warn of all the possible hazardous consequences that might result from failure to follow these instructions.

This vehicle has a high voltage power system. Disabling the system is required when working on or around the high voltage system and high voltage battery pack (other than testing the system using the procedures in this manual).

To help avoid severe shocks and burns and vehicle damage, always follow the cautions in this manual to disable the high voltage system. See the high voltage disable and enable procedure in the front of this service manual.

This vehicle is equipped with Supplemental Inflatable Restraint (SIR). Refer to "CAUTIONS" under "On-Vehicle Service" and the SIR Component and Wiring Location views in the "SIR Service Manual" before performing service on or around SIR components or wiring. Failure to follow "CAUTIONS" could result in possible air bag deployment, personal injury, otherwise unneeded SIR system repairs.

To help avoid accidental air bag deployment and personal injury, when servicing a vehicle that requires repair of the SIR system and another vehicle system, it is recommended that the SIR be repaired first using service manual procedures.

CAUTION

Saturn Service Manuals are intended for use by professional, qualified technicians. Attempting repairs or service without the appropriate training, tools, and equipment could cause injury to you or others and damage to your vehicle that may cause it not to operate.

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SIR

NOTICE

Always use the correct fastener in the proper location. When you replace a fastener, use ONLY the exact part number for that application.

The applicable service procedure will identify, where necessary, those fasteners that must be replaced after removal; or those fasteners that require thread lockers or thread sealant.

UNLESS OTHERWISE SPECIFIED, do not use supplemental coatings (paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and the joint clamping force, and may damage the fastener.

When you install fasteners, use the correct tightening sequence and specifications.

Following these instructions can help you avoid damage to parts and systems.

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GLOSSARY OF ACRONYMS

Acronym	Definition
ABS	Anti-Lock Braking System
AM	Amplitude Modulation
Amp	Ampere
APM	Accessory AC and DC Power Control Module. With PIM, makes up PEB
APS	Auxiliary Power Supply (part of APM)
BCA	Bias Control Assembly
BPM	Battery Pack Module
BTCM	Brake/Torque Control Module
BTSI	Brake Transmission Shift Interlock (GM)
CD	Compact Disc
cfm	Cubic Feet per Minute
cg	Center of Gravity
CHMSL	Center High-Mount Stop Lamp
CMC	Compressor Motor Controller (part of APM)
CPA	Connector – Positive Assurance
CR	Charge Receptacle
CRFM	Condenser Radiator Fan Module (part of HPVS)
CTPS	Check Tire Pressure System
DC	Direct Current
DLC	Data Link Connector
DERM	Diagnostic and Energy Reserve Module (SIR control module)
DIA	Dealer Installed Accessory
DM	Drive Motor
DRL	Daytime Running Light
DSCM	Display, Steering and Chime Module (IPS)
E/M	English/Metric
EHPS	Electro-Hydraulic Power Steering
EKP	External Keypad
EMB	Electro-Magnetic Brake (part of ABS)
EMI	Electromagnetic Interference
EPS	Electric Power Steering. Also see EHPS
ESB	Expansion Spring Brake (part of ABS)

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GLOSSARY OF ACRONYMS CONTINUED

Acronym	Definition
EEPROM	Electronically Erasable Programmable Read Only Memory
ETS	Electronic Traction System
EV	Electric Vehicle
EVO	Electronic Variable Orifice Control (in power steering pump)
FLIP	Forward Lamp – Instrument Panel Harness. Name of major EV low voltage wire harness
FM	Frequency Modulation
FOD	Front of Dash
g	Gram
GA	General Assembly
GVMR	Gross Vehicle Mass Rating
GVW	Gross Vehicle Weight
HPVM	Heat Pump Ventilation Module
HPVS	Heat Pump Ventilation System. Similar to HVAC on ICE vehicles
HTCM	HPVS/Thermal Control Module
HV	High Voltage
HVAC	Heating, Ventilating, and Air Conditioning (on ICE vehicles. For EV, see HPVS).
HWS	Heated Windshield
Hz	Hertz (cycles per second)
I/O	Input(s)/Output(s)
IC	Integrated Circuits
IGBT	Isolated Gate Bipolar Transistor
IP	Instrument Panel
IPC	Instrument Panel Cluster
ISRV	Inside Rear View (mirror)
KAM	Keep Alive Memory
kg	Kilogram
km	Kilometer
km/h	Kilometers per hour

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GLOSSARY OF ACRONYMS CONTINUED

Acronym	Definition
kPa	Kilo Pascals
kW	Kilowatt
kWh	Kilowatt–hour
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LF	Left Front
LH	Left Hand
LHD	Left Hand Drive
LHJB	Left Hand Junction Block
LR	Left Rear
LVW	Loaded Vehicle Weight
m	Meter
MMC	Metal Matrix Composite (rear brake drum material)
MHz	Megahertz
mi	Mile(s)
MPH	Miles Per Hour
MSRP	Manufacturers Suggested Retail Price (includes dealer preparation)
MUX	Multiplex or Multiplexer
N	Newton(s)
NTF	No Trouble Found. Reported failure does not reoccur under test
OEM	Original Equipment Manufacturer
OSRV	Outside Rear View (mirror)
PCM	Propulsion Control Module (Drive Motor)
PDT	Portable Diagnostic Tool
PEB	Power Electronics Bay
PIM	Power Inverter Module
POA	Part of Assembly
PRND	Park–Reverse–Neutral–Drive, as in PRND Selector
PROM	Programmable Read Only Memory
PSCM	Power Steering Control Module
PTC	Positive Thermal Coefficient. Term for resistive heating module
PSOC	Pack State Of Charge

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GLOSSARY OF ACRONYMS CONTINUED

Acronym	Definition
PTC	Positive Thermal Coefficient.
PWM	Pulse Width Modulation, or Pulse Width Modulated
QDM	Quad Driver Module
RAM	Random Access Memory
RF	Right Front
RF	Radio Frequency
RH	Right Hand
RHJB	Right Hand Junction Block
RMS	Root-Mean-Squared
ROM	Read Only Memory
RP	Reduced Performance
RPM	Revolutions Per Minute
RR	Right Rear
RSA	Run/Lock Shifter Assembly
SDL	Serial Data Link
SDM	Sensing and Diagnostic Module
SIR	Supplemental Inflatable Restraint (air bag) system
SLA	Short-Long Control Arm (suspension system)
SOC	State of Charge (battery pack). Usually expressed as a percentage
SN	Service Now
SSPO	Saturn Service Parts Operation
SS	Service Soon
SWA	Steering Wheel Angle
TNF	Trouble – Not Found. Reported failure reoccurs but cause cannot be determined
TJB	Trunk Junction Block
TPA	Terminal – Positive Assurance
T/S	Turn Signal
TT	Telltale

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GLOSSARY OF ACRONYMS CONTINUED

Acronym	Definition
UART	Universal Asynchronous Receiver – Transmitter (communications IC)
UH	Under Hood
ULEV	Ultra-Low Emissions Vehicle
USOC	User State Of Charge
V5B	5 Volt Supply
VAC	Voltage, Alternating Current
VF	Vacuum Fluorescence
VH	Vehicle Handling
VIN	Vehicle Identification Number
VTD	Vehicle Theft Deterrent
W	Watt
WSS	Wheel Speed Sensor (part of ABS)
WSW	Windshield Washer/Wiper
ZEV	Zero Emission Vehicle

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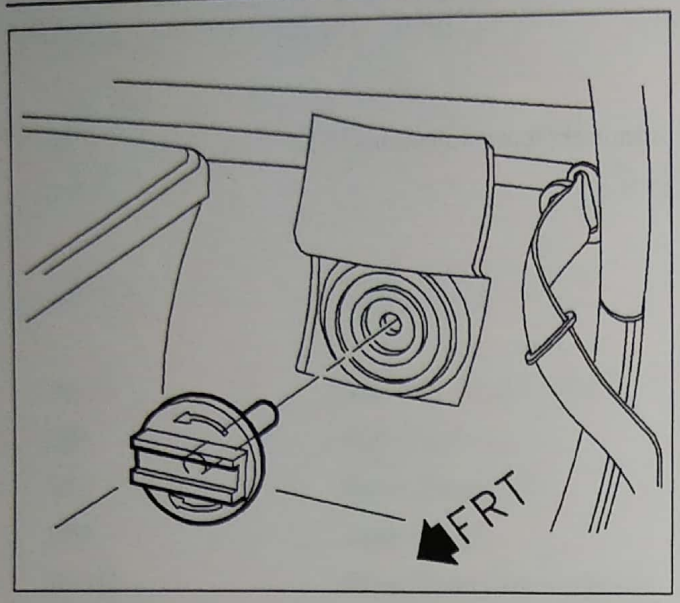

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HIGH VOLTAGE DISABLE

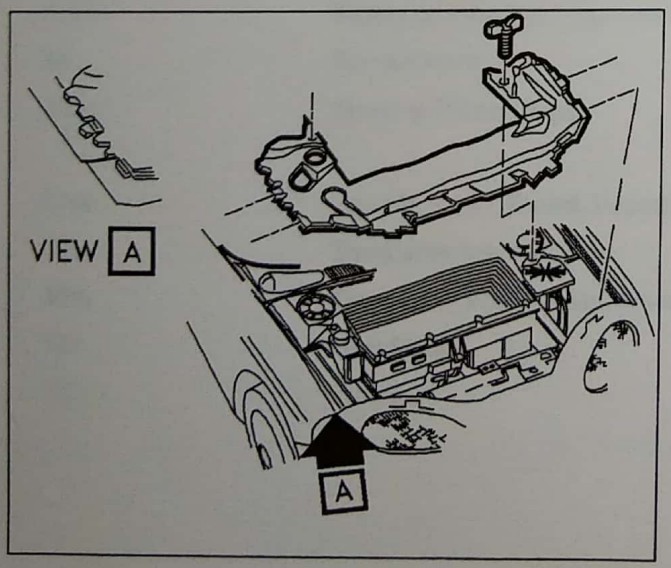
REMOVAL

CAUTION: TO REDUCE THE RISK OF SEVERE SHOCKS AND BURNS, THE HIGH VOLTAGE SYSTEM SHOULD BE DISABLED ANY TIME SERVICE WORK IS BEING PERFORMED ON OR AROUND THE HIGH VOLTAGE SYSTEM. WHEN IN DOUBT, ALWAYS DISABLE THE HIGH VOLTAGE SYSTEM. THE 12 VOLT SYSTEM WILL STILL BE ACTIVE AFTER THE HIGH VOLTAGE SYSTEM HAS BEEN DISABLED.

1. Place the vehicle in the "RUN" mode.
2. Remove the manual disconnect knob.
   a. Tilt the drivers seat forward.
   b. Raise the carpet flap, located on the battery tunnel behind the drivers seat.
   c. Turn the manual disconnect knob counterclockwise and pull the manual disconnect knob straight out.

IMPORTANT: An audible click should be heard when turning the manual disconnect knob. This click indicates the automatic disconnect relays have opened.

3. Verify high voltage has been removed.
   a. Connect scan tool to the data link connector (DLC) and run the High Voltage special test. Battery pack module (BPM) diagnostic trouble codes (DTCs) 312, 280 and/or 275 should be present, which indicates BPM and auto disconnect recognized a high voltage disconnect.
   b. If test fails, refer to service manual "High Voltage Special Test Failed" in the "Battery and Charging System Service Manual."
4. Remove engine compartment sight shield.



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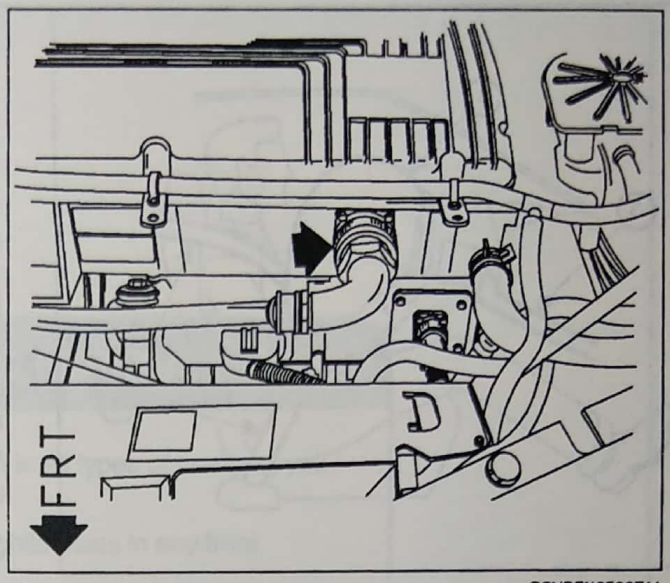
CAUTION: TO REDUCE THE RISK OF SEVERE SHOCKS AND BURNS, ALWAYS ASSUME THE HIGH VOLTAGE IS PRESENT WHEN DISCONNECTING THE CHARGE RECEPTACLE TO PIM CONNECTOR. DO NOT ALLOW THE CONNECTOR BODY TO TOUCH THE PINS OF THE PIM WHEN REMOVING THE CONNECTOR.

5. Remove the charge receptacle to power inverter module (PIM) cannon connector using one hand.



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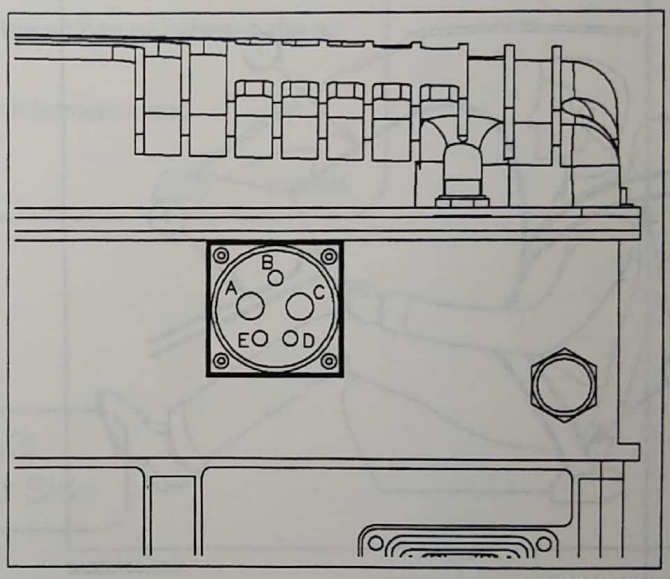
6. Using a DVOM and only one hand, measure from pin A of the PIM to chassis ground and from pin C of the PIM to chassis ground and from pin A to C. All measurements should be less than 10 volts. Pin C and Pin A are the large high voltage pins on the PIM.
   a. If the voltage is less than 10 volts, high voltage system is disabled.
   b. If the voltage is greater than 10 volts, refer to the "High Voltage" section in the "Battery and Charging Service Manual."



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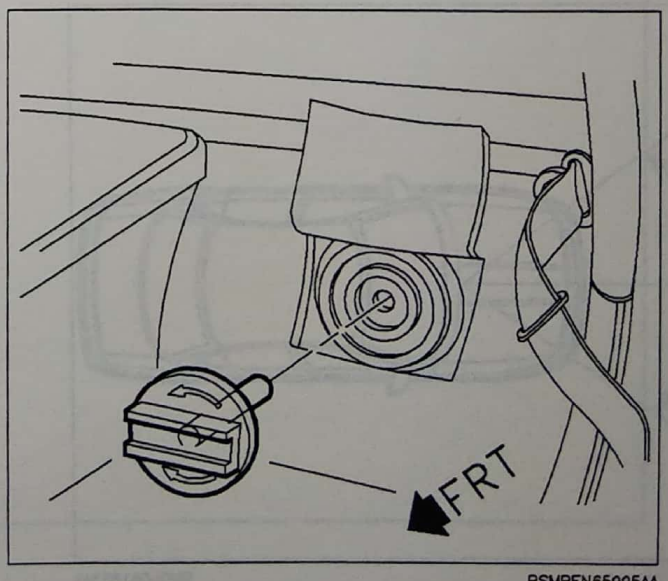
HIGH VOLTAGE ENABLE

INSTALLATION

1. Install charge receptacle to PIM cannon connector.
2. Install engine compartment sight shield.
3. Tilt driver's seat forward.
4. Raise the carpet flap, located on the battery tunnel behind the driver's seat.
5. Install the manual disconnect knob by pushing the shaft straight into the hole and turning clockwise.
6. Clear all DTCs using the scan tool.



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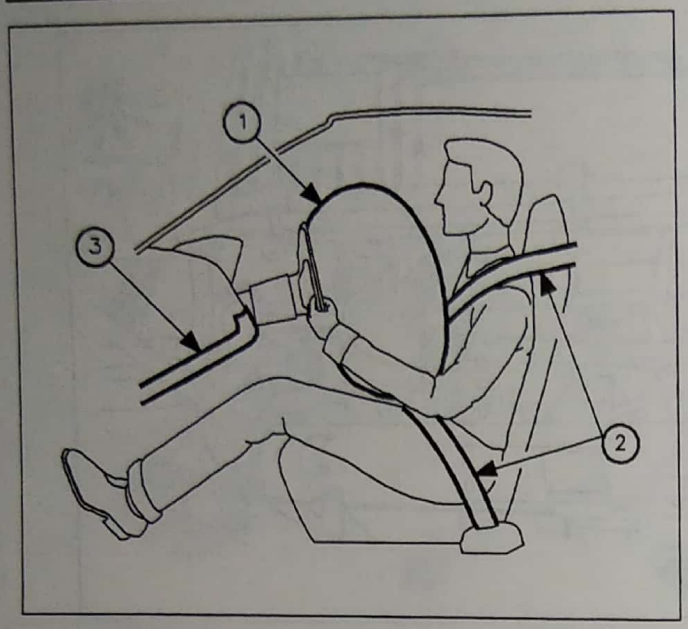

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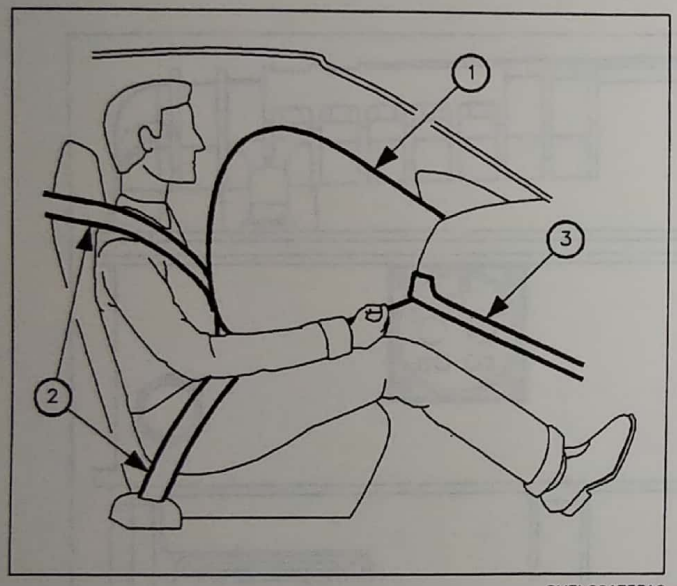

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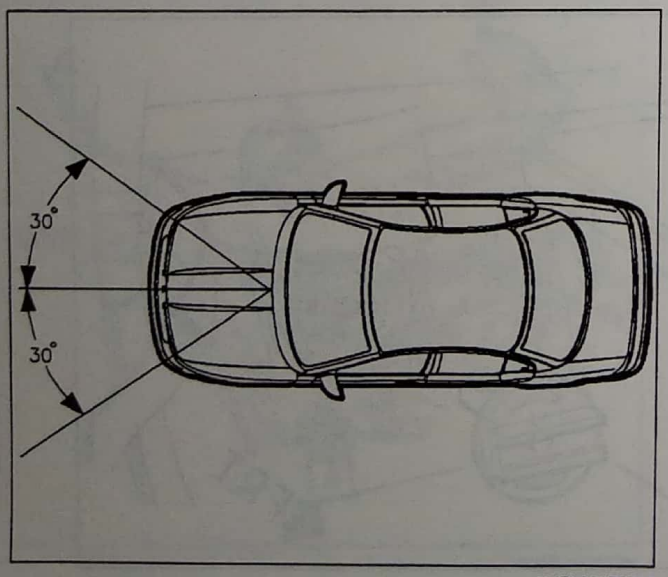

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INTRODUCTION

GENERAL DESCRIPTION RESTRAINT SYSTEM

This supplemental inflatable restraint (SIR) helps supplement the protection offered by the seat belts by deploying air bags during certain frontal crashes. The air bags deploy when the vehicle is involved in a frontal crash of sufficient force up to 30 degrees left or right of the centerline of the vehicle. To further absorb the crash energy there are knee bolsters located beneath the instrument panel for both the driver and passenger. Additionally, the steering column is collapsible.

① Deployed Air Bag

② Seat Belts

③ Knee Bolster

CAUTION: TO AVOID SERIOUS INJURY

- For maximum safety protection in all types of crashes, you must wear your safety belt.
- Do not install rearward-facing child seats in any front passenger seat position.
- Do not sit or lean unnecessarily close to the air bag.
- Do not place any objects over the air bag or between the air bag and yourself.

See the owner's manual for further information and explanations.

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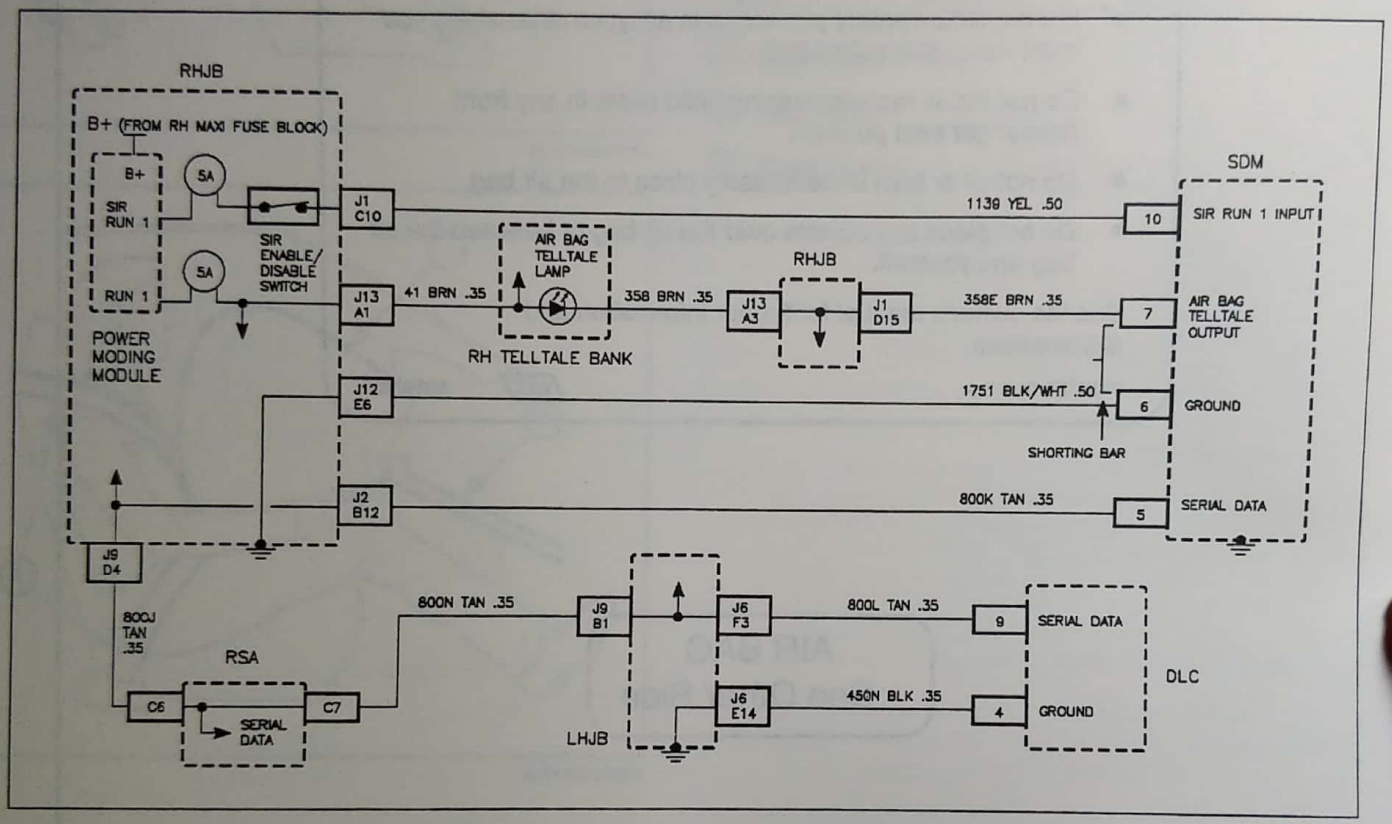
AIR BAG
See Other Side

SIR SYSTEM DESCRIPTION

The SIR System consists of the sensing and diagnostic module (SDM), the driver inflator module, the SIR coil assembly, the passenger inflator module and the AIR BAG telltale lamp in the instrument cluster. The SDM, SIR coil assembly (driver's side only), driver inflator module, passenger inflator module and connecting wires make up the deployment loops. The function of the deployment loops is to supply current through the inflator modules, which will cause deployment of the air bags in the event of a frontal crash of sufficient force, up to 30 degrees left or right of the center line of the vehicle. The inflator modules are only supplied enough current to deploy when the SDM detects vehicle velocity changes severe enough to warrant deployment.

The SDM contains a sensing device which converts the vehicles acceleration changes to an electrical signal. The electrical signal generated is processed by the SDM and then compared to values stored in electrically erasable programmable read only memory (EEPROM). When the proper thresholds are exceeded, the SDM will cause current to flow through the inflator modules deploying the air bags.



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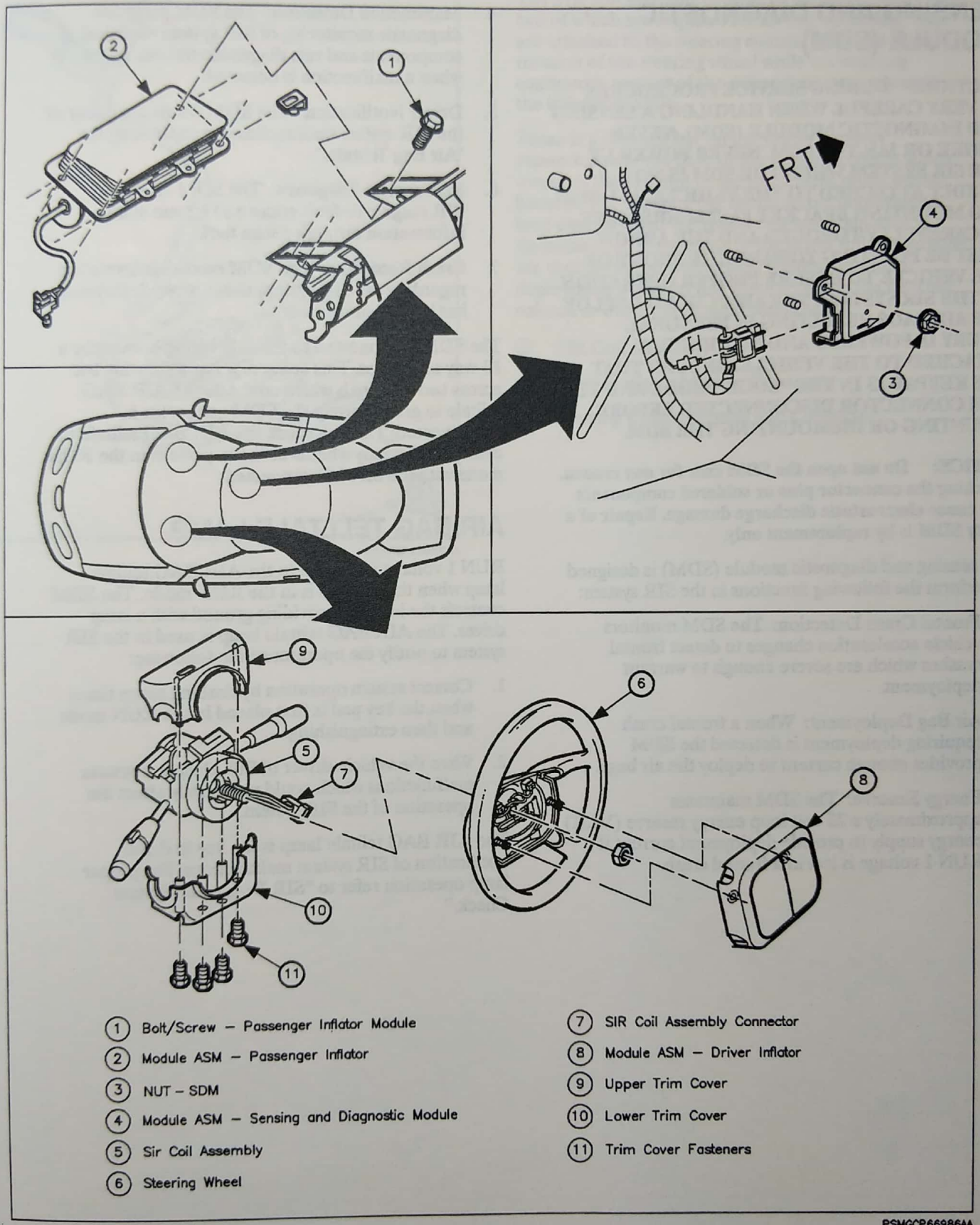
SIR COMPONENT LOCATION AND WIRING VIEW



1. Bolt/Screw – Passenger Inflator Module
2. Module ASM – Passenger Inflator
3. NUT – SDM
4. Module ASM – Sensing and Diagnostic Module
5. Sir Coil Assembly
6. Steering Wheel
7. SIR Coil Assembly Connector
8. Module ASM – Driver Inflator
9. Upper Trim Cover
10. Lower Trim Cover
11. Trim Cover Fasteners

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COMPONENT DESCRIPTION

SENSING AND DIAGNOSTIC MODULE (SDM)

CAUTION: DURING SERVICE PROCEDURES BE VERY CAREFUL WHEN HANDLING A SENSING AND DIAGNOSTIC MODULE (SDM). NEVER STRIKE OR JAR THE SDM. NEVER POWER UP THE SIR SYSTEM WHEN THE SDM IS NOT RIGIDLY ATTACHED TO THE VEHICLE. ALL SDM AND MOUNTING BRACKET FASTENERS MUST BE CAREFULLY TORQUED AND THE ARROW MUST BE POINTING TOWARD THE FRONT OF THE VEHICLE TO ENSURE PROPER OPERATION OF THE SIR SYSTEM. THE SDM COULD DEPLOY THE AIR BAGS RESULTING IN PERSONAL INJURY IF POWERED AND NOT RIGIDLY ATTACHED TO THE VEHICLE. BE SURE THAT THE KEYPAD IS IN THE "LOCK" MODE AND THE SDM CONNECTOR DISCONNECTED BEFORE MOUNTING OR DISMOUNTING THE SDM.

NOTICE: Do not open the SDM case for any reason. Touching the connector pins or soldered components may cause electrostatic discharge damage. Repair of a faulty SDM is by replacement only.

The sensing and diagnostic module (SDM) is designed to perform the following functions in the SIR system:

1. Frontal Crash Detection: The SDM monitors vehicle acceleration changes to detect frontal crashes which are severe enough to warrant deployment.
2. Air Bag Deployment: When a frontal crash requiring deployment is detected the SDM provides enough current to deploy the air bags.
3. Energy Reserve: The SDM maintains approximately a 23 volt loop energy reserve (VLR) energy supply to provide deployment current if RUN 1 voltage is lost in a frontal crash.
4. Malfunction Detection: The SDM performs diagnostic monitoring of SIR system electrical components and sets diagnostic trouble codes when a malfunction is detected.
5. Driver Notification: The SDM warns the driver of the SIR system malfunctions by controlling the "Air Bag Telltale."
6. Malfunction Diagnosis: The SDM displays SIR diagnostic fault codes and system status information through a scan tool.
7. Crash Recording: The SDM records information regarding the SIR system status when deployment has been commanded.

The SDM is connected to the SIR wiring harness by a 12-way connector. This connector has a shorting bar across two terminals which connects the AIR BAG telltale to ground when the SDM connector is disconnected. This will cause the AIR BAG telltale to come "On" steady whenever the key pad is in the RUN mode with the SDM disconnected.

AIR BAG TELLTALE LAMP

RUN 1 voltage is applied to the AIR BAG telltale lamp when the key pad is in the RUN mode. The SDM controls the lamp by providing ground with a lamp driver. The AIR BAG telltale lamp is used in the SIR system to notify the operator of the following:

1. Correct system operation by flashing seven times when the key pad is first placed in the RUN mode and then extinguishing.
2. Warn the vehicle driver of SIR electrical system malfunctions which could potentially affect the operation of the SIR system.

The AIR BAG telltale lamp is the key to driver notification of SIR system malfunctions. For proper lamp operation refer to "SIR Diagnostic System Check."

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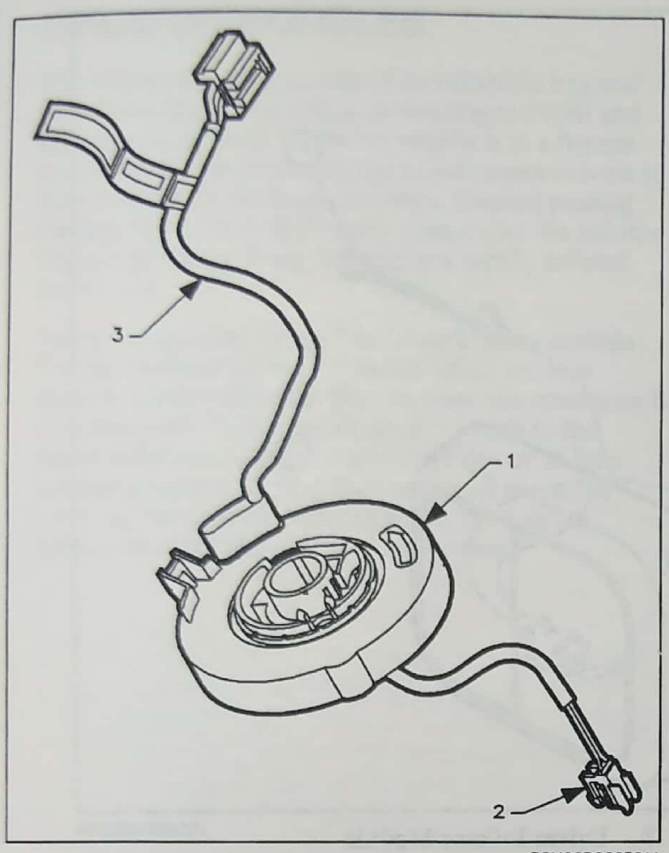

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SIR COIL ASSEMBLY

The SIR coil assembly consists of current carrying coils, two of which are required for air bag operation. They are attached to the steering column shaft and allow rotation of the steering wheel while maintaining continuous contact of the driver deployment loop to the inflator module.

There is a shorting bar on the yellow two-way connector near the base of the steering column which connects the SIR coil to the instrument panel wiring harness. The shorting bar shorts across deployment loop circuits when the yellow two-way connector is disconnected. The circuits to the driver inflator module are shorted in this way to help prevent unwanted deployment of the air bag when servicing the steering column or other SIR system components.

① SIR Coil Assembly

② Driver Inflator Module Connector

③ Steering Column Pigtail and Connector

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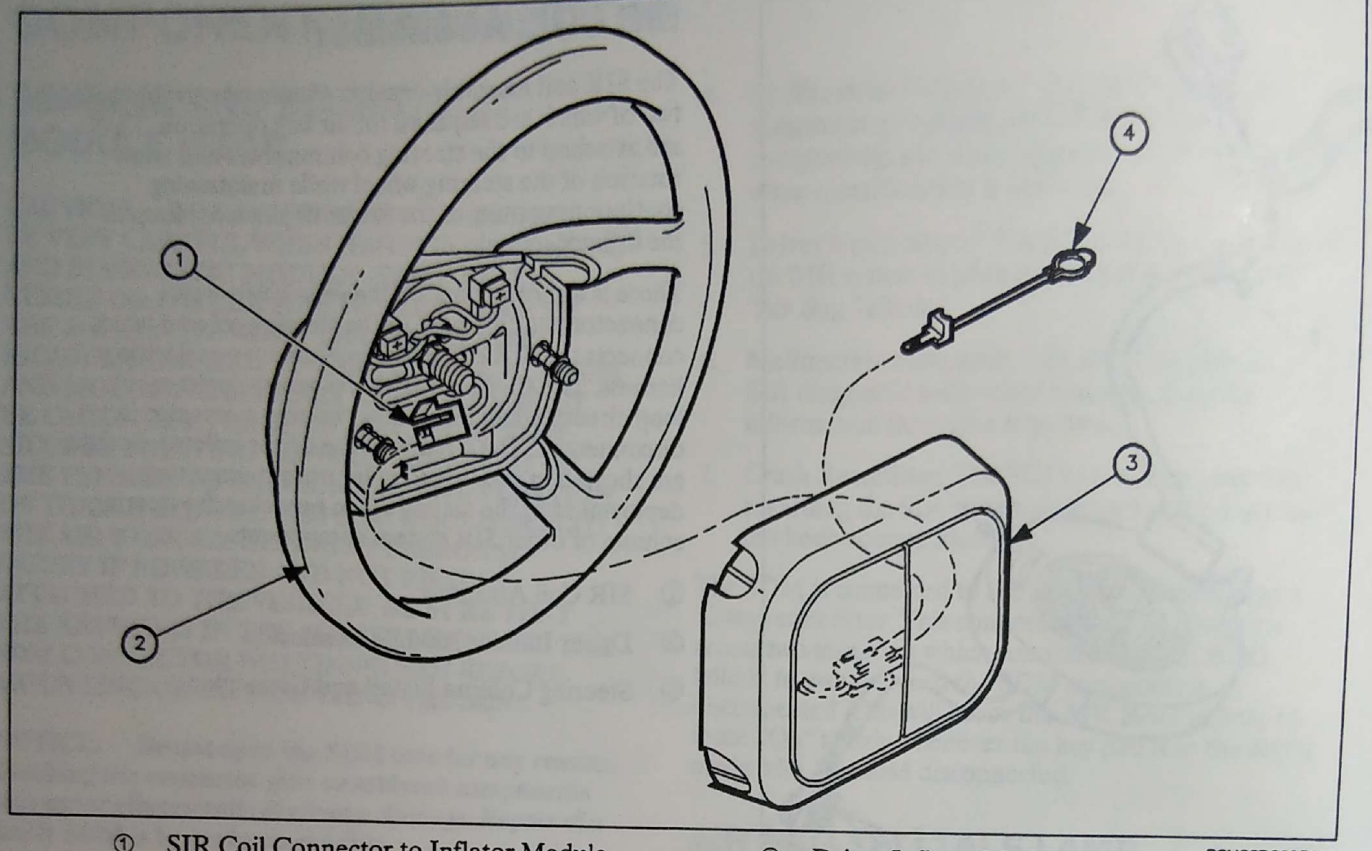

① SIR Coil Connector to Inflator Module
② Steering Wheel
③ Driver Inflator Module
④ Connector Positive Assurance

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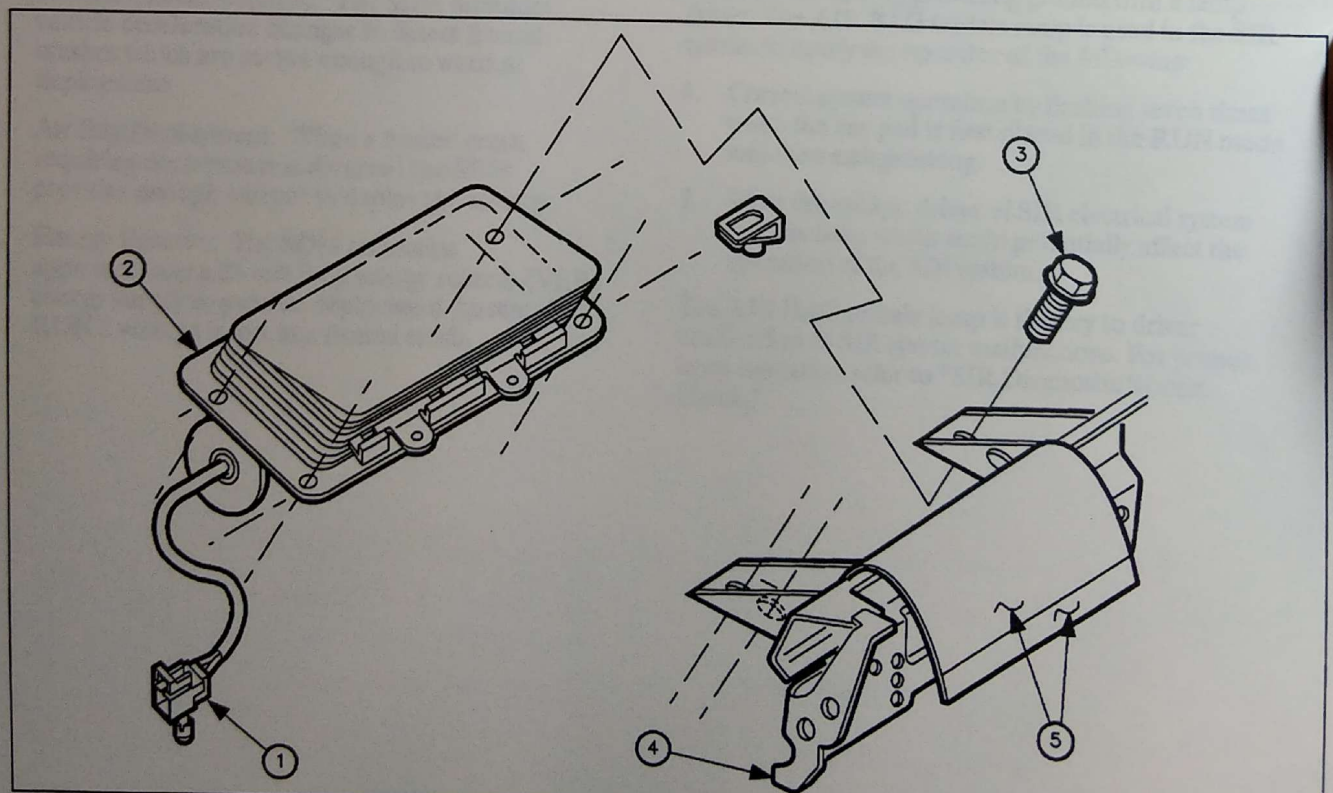

① Connector – Passenger Inflator Module
② Passenger Inflator Module
③ Hex Head Screws
④ I/P passenger knee bolster reinforcement
⑤ Guidance Shoot/ With Adhesive Tape

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INFLATOR MODULES

The inflator modules consist of an inflatable bag and an inflator (a canister of gas-generating material and an initiating device). When the vehicle is in a frontal crash requiring deployment the SDM causes current to flow through the deployment loops. Current passing through the initiator ignites the material in the inflator. The gas produced from this reaction rapidly inflates the air bag.

There is a shorting bar on the driver inflator module. The shorting bar shorts across the driver inflator module deployment loop circuits when the connector is disconnected. The deployment loop circuit to the driver inflator module is shorted in this way to help prevent unwanted deployment of the air bag when servicing the driver inflator module, the steering column or other SIR system components.

There is a shorting bar on the passenger inflator module connector which connects the passenger inflator module to the instrument panel wiring harness. The shorting bar shorts across the passenger inflator module deployment loop circuits when disconnected. The circuit to the passenger inflator module is shorted in this way to help prevent unwanted deployment of the air bag when servicing the passenger inflator module, the instrument panel or other SIR system components.

STEERING COLUMN

The steering column is energy absorbing and is designed to compress in a frontal crash to minimize injury to the driver.

KNEE BOLSTERS

The knee bolsters are used to absorb energy and control the forward movement of the driver and passenger during a frontal crash by limiting leg movement.

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DEFINITIONS

ACTIVE FAULT – Fault currently detected.

AIR BAG – An inflatable cloth cushion designed to deploy in certain frontal crashes. It supplements the protection offered by the seat belt by distributing the impact load more evenly over the occupant's head and torso.

B+ – Battery voltage, the voltage available at the auxiliary battery at the time of the indicated measurement.

BULB CHECK – The SDM will cause the AIR BAG warning lamp to flash seven times and then go "Off" whenever the key pad transitions to the RUN mode from any other key pad modes and no malfunctions are detected.

CONTINUOUS MONITORING – Tests performed by the SDM on the SIR system every 100 milliseconds while "RUN 1" voltage is present at the SDM.

CURRENT SOURCE DIAGNOSTICS – Tests performed by the SDM after RUN 1 23 VLR, and deployment loop voltages are all measured within their respective normal voltage ranges. This test checks for proper resistance of the deployment loops and for proper operation of the driver and passenger current sources.

DATA LINK CONNECTOR (DLC) (Formerly called the ALDL) – Connector which is connected by wires to multiple on-board computers allowing communication with an off-board computer such as a scan tool.

DEPLOY – To inflate the air bag.

DEPLOYMENT LOOP – The circuits used to supply current to the inflator module to deploy the air bag.

DIAGNOSTIC TROUBLE CODE (DTC) – A numerical designator used by the SDM to indicate specific SIR system malfunctions.

DRIVER CURRENT SOURCE – An output of the SDM which provides current to the driver inflator module.

DRIVER INFLATOR MODULE – An assembly located in the steering wheel hub consisting of an inflatable bag, an inflator and an initiator.

EEPROM – Electrically erasable programmable read only memory. Memory which retains its contents when power is removed from the SDM.

HIGHER PRIORITY FAULT – Each diagnostic fault code is assigned a priority based on the detectability with other codes present. The priority corresponds to the detectability of the malfunction only and does not relate to the criticality of the malfunction with respect to deployment or non-deployment under any given condition.

HISTORY FAULT – Faults detected since last "CLEAR Codes" command. After 125 fault free ignition cycles history codes are cleared.

RUN CYCLE – The voltage at the SDM "RUN 1" input, with the key pad in the RUN mode, is greater than nine volts for at least ten seconds before placing the key pad in the "LOCK" mode.

RUN 1 – A regulated voltage which is only available with the key pad in the RUN mode, approximately 13.5 – 14.5 volts.

INITIATOR – The electrical component inside the inflator module which, with sufficient current flow, starts the chemical reaction that inflates the air bag.

NORMAL OPERATING VOLTAGE RANGE – The voltage measured between the SDM "RUN 1" terminal and "GROUND" terminal is between 9 and 16 volts.

PASSENGER CURRENT SOURCE – An output of the SDM which provides current to the passenger inflator module.

PASSENGER INFLATOR MODULE – An assembly located in the right side of the instrument panel consisting of an inflatable bag, an inflator and an initiator.

PORTABLE DIAGNOSTIC TOOL (PDT) – An off-board computer used to read diagnostic information from on-board computers via data link connector.

POSITIVE TEMPERATURE COEFFICIENT – A circuit protection device that is self resetting after the short circuit is repaired and current flow is removed (a specified value).

SDM – Sensing and diagnostic module which provides reserve energy to the deployment loops, deploys the air bag when required and performs diagnostic monitoring of all system components.

SERIAL DATA – Information representing the status of the queried system.

SIR – Supplemental inflatable restraint.

SIR COIL – An assembly of current-carrying coils (two for SIR) in the driver deployment loop that allows the rotation of the steering wheel while maintaining the continuous contact of the driver deployment loop to the driver inflator module.

SIR WIRING HARNESS – The wires and connectors that electrically connect the components in the SIR system.

TURN-ON-TESTS – Tests which the SDM performs on the SIR system once during each RUN cycle immediately after RUN 1 voltage is applied to the SDM and before "Continuous Monitoring."

23 VLR (Volt Loop Reserve) – Energy storage to permit detection of a crash incident, command deployment, and initiate driver and passenger inflator module deployment, if RUN1 is lost.

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DIAGNOSIS

NOTICE: TO AVOID DEPLOYMENT WHEN TROUBLESHOOTING THE SIR SYSTEM DO NOT USE ELECTRICAL TEST EQUIPMENT SUCH AS A BATTERY POWERED OR AC POWERED VOLTMETER, OHMMETER, ETC., OR ANY OTHER TYPE OF ELECTRICAL EQUIPMENT OTHER THAN THAT SPECIFIED IN THIS MANUAL. INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

DIAGNOSTIC TROUBLE CODES

The "SIR Diagnostic System Check" must always be the starting point at any SIR system diagnosis. The "SIR Diagnostic System Check" checks for proper AIR BAG telltale lamp operation and checks for SIR diagnostic trouble codes using a scan tool.

1. Active diagnostic trouble codes – Malfunctions that are presently being detected. Current diagnostic fault codes are stored in random access memory (RAM).
2. History diagnostic trouble codes – All malfunctions detected since the last time the history memory was cleared. History diagnostic trouble codes are stored in electrically erasable programmable read only memory (EEPROM).

SCAN TOOL DIAGNOSTIC

A scan tool is used to read active and history diagnostic trouble codes and to clear all diagnostic trouble codes after a repair is completed. The scan tool must be updated to communicate with the SIR system. To use a scan tool, connect it to the data link connector and place the key pad in the RUN mode. The scan tool reads serial data from the SDM "SERIAL DATA" output terminal "5" to the Data Link Connector terminal "9."

INTERMITTENTS/HISTORY CODES/POOR CONNECTIONS

History codes are those indicating that the SDM has previously detected a fault which is no longer present. Most intermittents are caused by faulty electrical connections or wiring. Some items to check are:

- Poor mating of connector halves or terminals not fully seated in the connector body (backed out).
- Dirt or corrosion on the terminals. The terminals must be clean and free of any foreign material which could impede proper terminal contact.
- Improperly formed or damaged terminals. All connector terminals in problem circuits should be checked carefully to ensure good contact tension. Use a corresponding mating terminal from SA 9206Z connector test adapter kit to check for proper tension, refer to "Checking Terminal Contact" in this section.

NOTICE: Connector test adapter kit SA 9206Z must be used whenever a diagnostic procedure requests checking or probing a terminal. This will ensure that no damage to the terminal will occur.

- Poor terminal-to-wire connection. Checking this requires removing the terminal from the connector. Some conditions which fall under this description are poor crimps, poor solder joints, crimping over the wire insulation rather than the wire itself, corrosion in the wire to terminal contact area, etc.
- Wire insulation which is rubbed through, causing an intermittent short as the bare area touches other wiring or parts of the vehicle.
- Wiring broken or practically broken inside the insulation. This condition would cause an added resistance and maybe over looked when checking for continuity, but if only one or two strands of wire are intact resistance would be too high not allowing proper current flow.

To avoid any of the above problems when making wiring or terminal repairs, always follow the instructions for wiring and terminal repair outlined in "Wiring Repair" in this section.

CHECKING TERMINAL CONTACT

When diagnosing an electrical system that utilizes Metri-Pack 150/280/480/630 series terminals it is important to check terminal contact between a connector and component or between in-line connectors before replacing a suspect component.

Mating terminals must be inspected to ensure good terminal contact. A poor connection between the male and female terminal at a connector may be the result of contamination or deformation.

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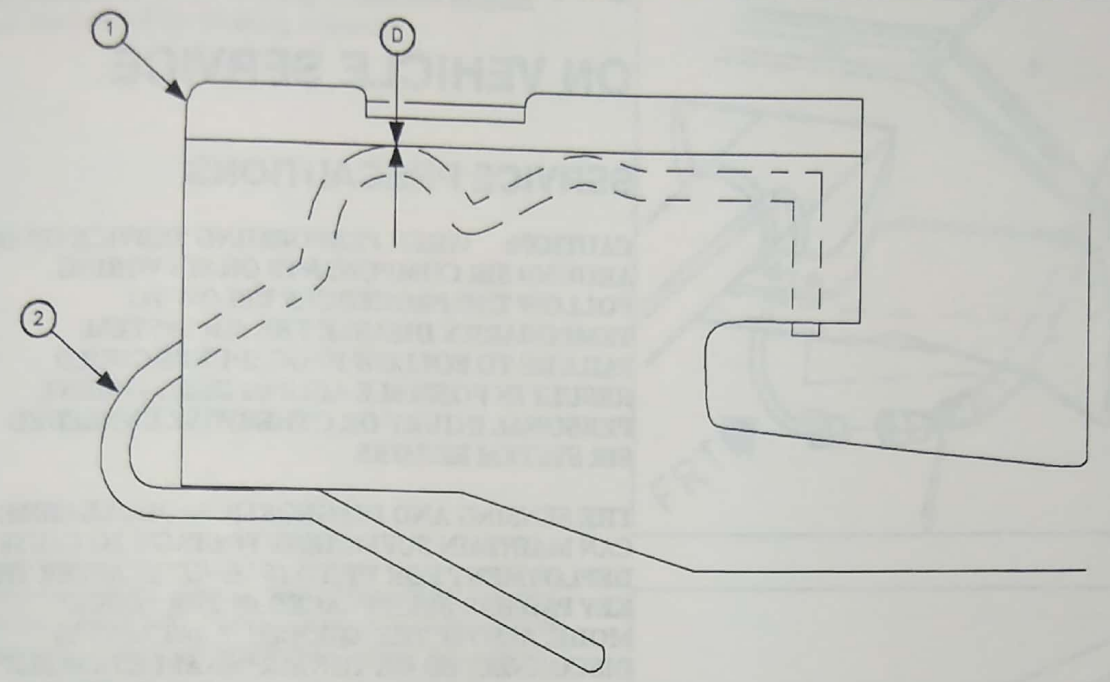
Contamination is caused by the connector halves being improperly connected, a missing or damaged connector seal or damage to the connector itself exposing the terminals to moisture and dirt. Contamination leads to terminal corrosion, causing an open circuit or intermittently open circuit.

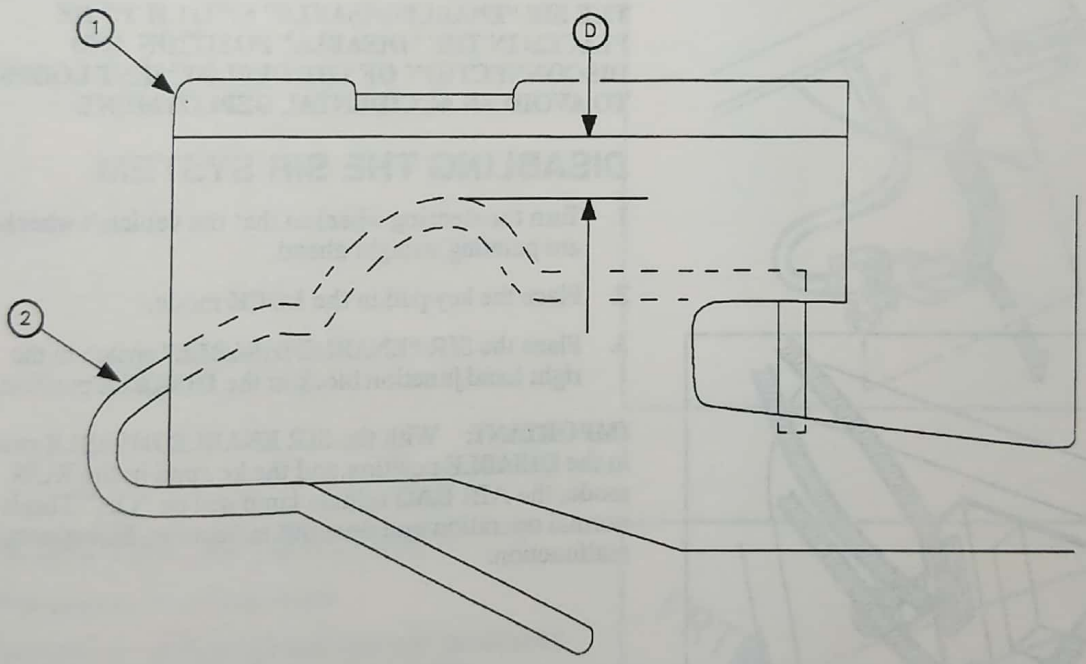
Inspect the connector halves for contamination. Contamination will result in a white or green build-up within the connector body or between terminals, causing high terminal resistance, intermittent connection or an open circuit. A connector that shows signs of contamination should be replaced in its entirety; terminals, seals and connector body.

NOTICE: Deformation is caused by probing the mating side of a connector terminal without the proper adapter, improperly joining the connector halves or repeatedly separating and joining the connector halves. Deformation, usually to the female terminal contact tang, can result in poor terminal contact causing an open or intermittently open circuit.

IMPORTANT: After an intermittent problem has been repaired clear SIR diagnostic trouble codes and repeat the SIR diagnostic system check.



D ABOUT EQUAL TO 0, GOOD TERMINAL CONTACT



D MUCH GREATER THAN 0, POOR TERMINAL CONTACT

(1) TYPICAL METRI-PACK 150/280/480/630 SERIES FEMALE TERMINAL (150 SERIES PUSH-TO-SEAT SHOWN)

(2) CONTACT TANG

(D) AMOUNT OF DEFORMATION

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SIR SYSTEM

ON VEHICLE SERVICE

SERVICE PRECAUTIONS

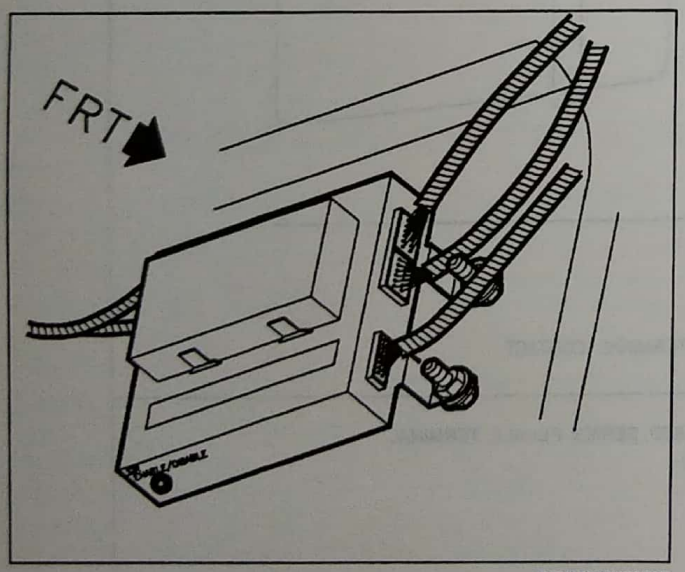
CAUTION: WHEN PERFORMING SERVICE ON OR AROUND SIR COMPONENTS OR SIR WIRING FOLLOW THE PROCEDURE BELOW TO TEMPORARILY DISABLE THE SIR SYSTEM. FAILURE TO FOLLOW PROCEDURES COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY OR OTHERWISE UNNEEDED SIR SYSTEM REPAIRS.

THE SENSING AND DIAGNOSTIC MODULE (SDM) CAN MAINTAIN SUFFICIENT VOLTAGE TO CAUSE A DEPLOYMENT FOR UP TO *10 MINUTES* AFTER THE KEY PAD HAS BEEN PLACED IN THE "LOCK" MODE, ALSO IF THE AUXILIARY BATTERY IS DISCONNECTED OR THE SIR "ENABLE/DISABLE" SWITCH IS PLACED IN THE DISABLE POSITION. MANY OF THE SERVICE PROCEDURES REQUIRE THE SIR "ENABLE/DISABLE" SWITCH TO BE PLACED IN THE "DISABLE" POSITION AND DISCONNECTION OF THE DEPLOYMENT LOOPS TO AVOID AN ACCIDENTAL DEPLOYMENT.

DISABLING THE SIR SYSTEM

1. Turn the steering wheel so that the vehicle's wheels are pointing straight ahead.
2. Place the key pad in the **LOCK** mode.
3. Place the SIR **"ENABLE/DISABLE"** switch in the right hand junction block in the **DISABLE** position.

IMPORTANT: With the SIR **ENABLE/DISABLE** switch in the **DISABLE** position and the key pad in the RUN mode, the AIR BAG telltale lamp will be "On." This is normal operation and does not indicate an SIR system malfunction.



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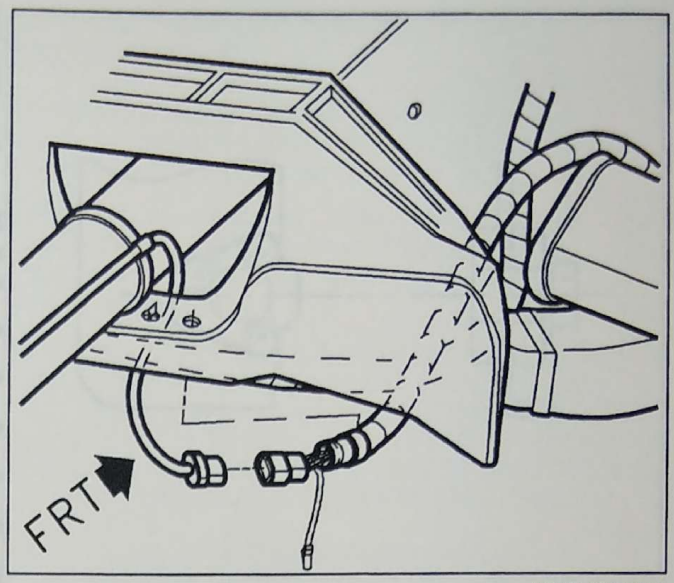
4. Remove connector position assurance (CPA) device and disconnect yellow two-way connector located near the base of the steering column.



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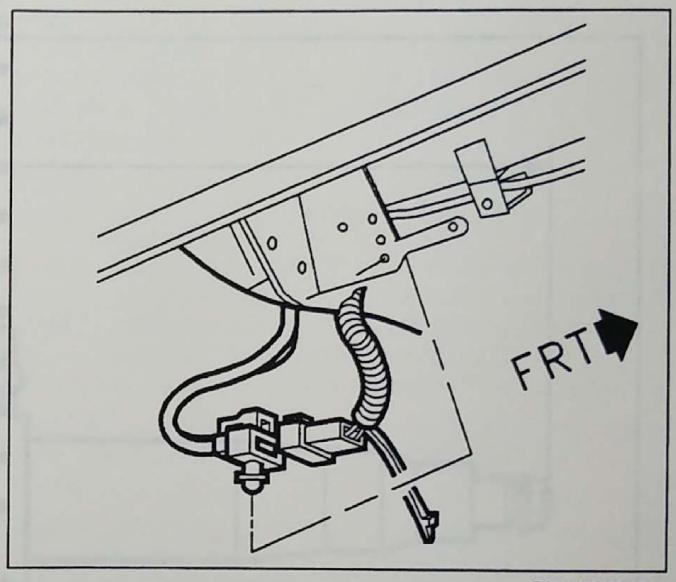
5. Remove connector position assurance (CPA) device and disconnect yellow two-way connector located on passenger inflator module pigtail under RH side of I/P.



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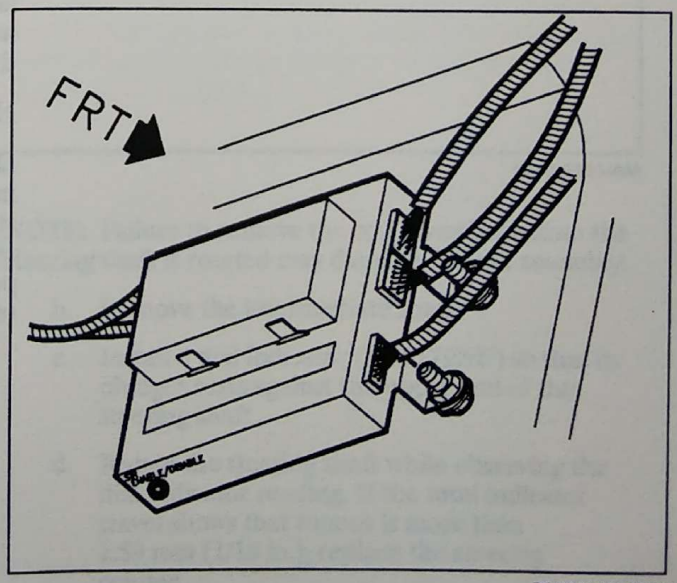
ENABLING THE SIR SYSTEM

1. Place key pad in the **LOCK** mode.
2. Connect yellow two-way SIR connector at the base of steering column and install connector position assurance (CPA) device to connector.
3. Connect yellow two-way passenger inflator module pigtail and install connector position assurance (CPA) to connector.
4. Place SIR **ENABLE/DISABLE** switch to the **ENABLE** position, located in the RH junction block.
5. Place key pad in the "RUN" mode and verify that the AIR BAG telltale lamp flashes seven times as the key pad is placed in the "RUN" mode and then goes Off. If lamp does not operate as described above perform the "SIR Diagnostic System Check" in this manual.



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REPAIRS AND INSPECTIONS REQUIRED AFTER AN ACCIDENT

IMPORTANT: The following SIR system components **must** be replaced after a frontal crash involving air bag deployment:

- SDM
- Driver inflator module
- Passenger inflator module
- Driver seatbelt retractor
- Passenger seat belt retractor

In all types of accidents, regardless of air bag deployment, visually inspect the following components and their mounting points and replace as required:

- Driver inflator module
- Steering wheel
- SIR coil assembly
- Steering column
- Steering column support foam energy absorber
- Driver seat and belts
- Passenger inflator module
- Passenger seat and belts
- SDM
- Knee bolsters and instrument panel mounting attachments

Inspect the SIR coil assembly wiring and steering wheel for any signs of scorching, melting or damage due to excessive heat. If the coil assembly wire or steering wheel is damaged replace them. The steering column and wheel must be dimensionally checked to determine if they are damaged.

Never use SIR parts from another vehicle.

Do not attempt to repair the driver or passenger inflator modules, the steering wheel, the SIR coil assembly, the steering column or the SDM. Service of these items is by replacement only. Verify replacement part numbers. No periodic maintenance of SIR components or system is required.

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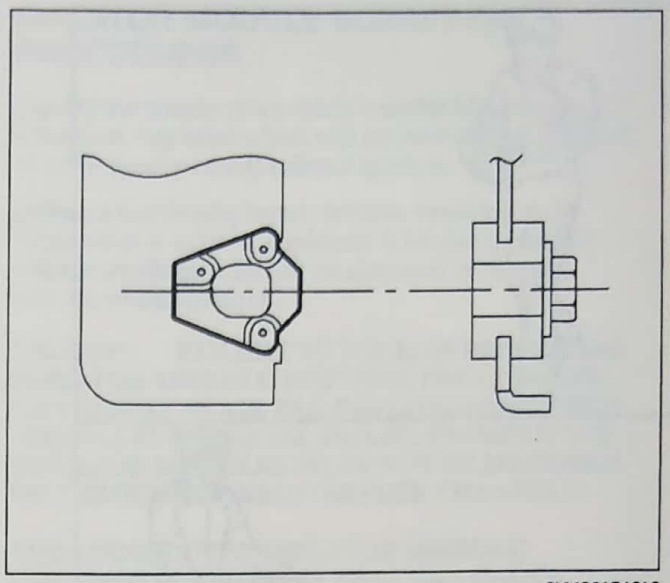
CHECKING THE STEERING COLUMN FOR ACCIDENT DAMAGE

NOTICE: Vehicles involved in accidents resulting in frame damage, major sheet metal damage or where the steering column has been impacted may also have a damaged or misaligned steering column. Failure to check the steering column for damage may result in component malfunction.

1. Inspect the capsules on the steering column assembly; all must be securely seated in bracket slots and checked for any loose conditions when pushed or pulled. If any movement exceeds 1.59 mm (1/16 in.), replace column.



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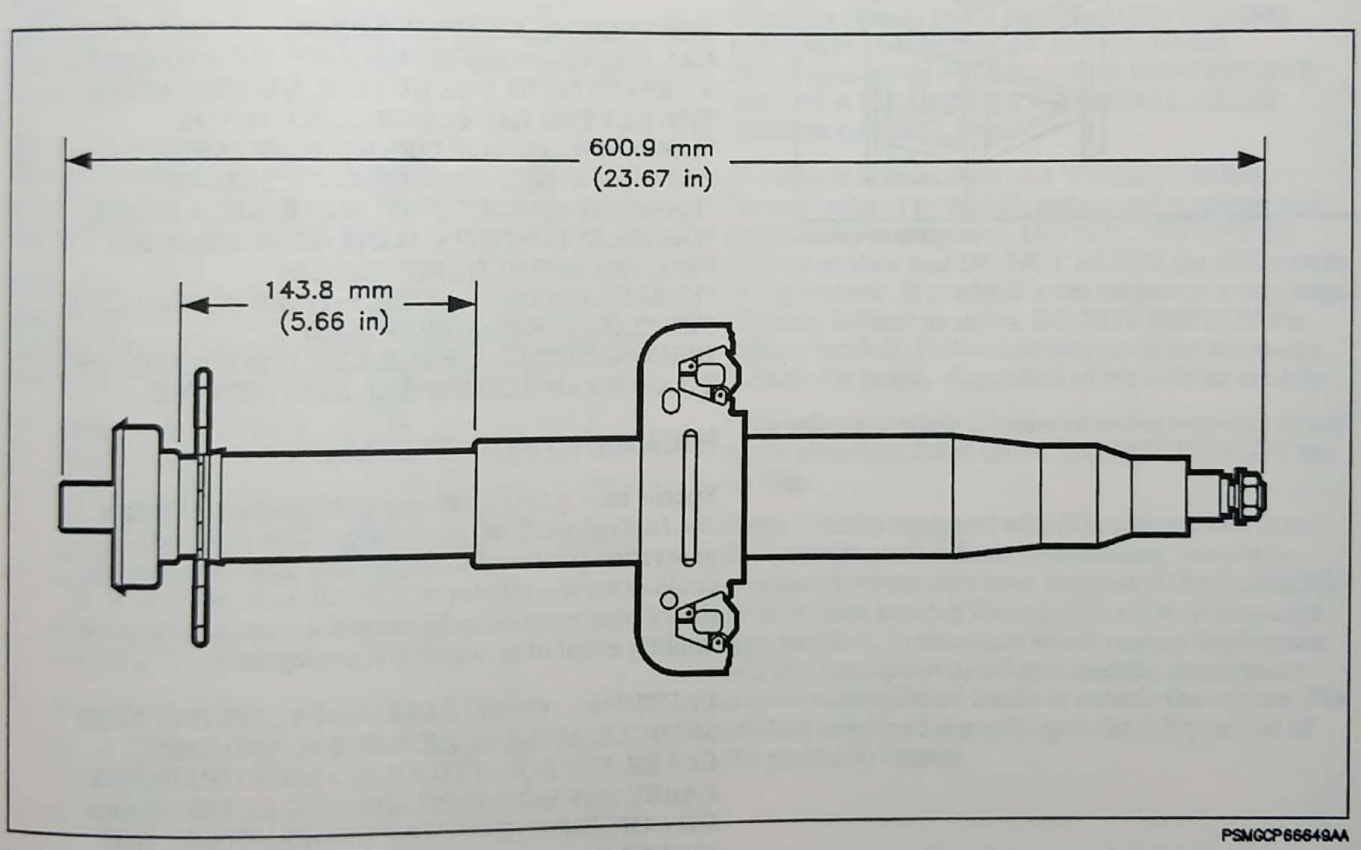

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2. Check the steering column jacket for collapse by measuring between the end of the bearing assembly and the lower edge of the upper bracket. If the dimension is less than 143.8 mm (5.66 in.), replace the jacket.
3. If the steering shaft is suspected of being bent check the steering shaft runout in the following steps:
   a. Remove the inflator module, steering wheel, shrouds and lever combination switch.

NOTE: Failure to remove the coil assembly before the steering shaft is rotated may damage the coil assembly.

   b. Remove the intermediate shaft.
   c. Install a dial indicator (SA9179NE) so that its plunger rests against the upper end of the steering shaft.
   d. Rotate the steering shaft while observing the dial indicator reading. If the total indicator travel shows that runout is more than 1.59 mm (1/16 in.), replace the steering column.

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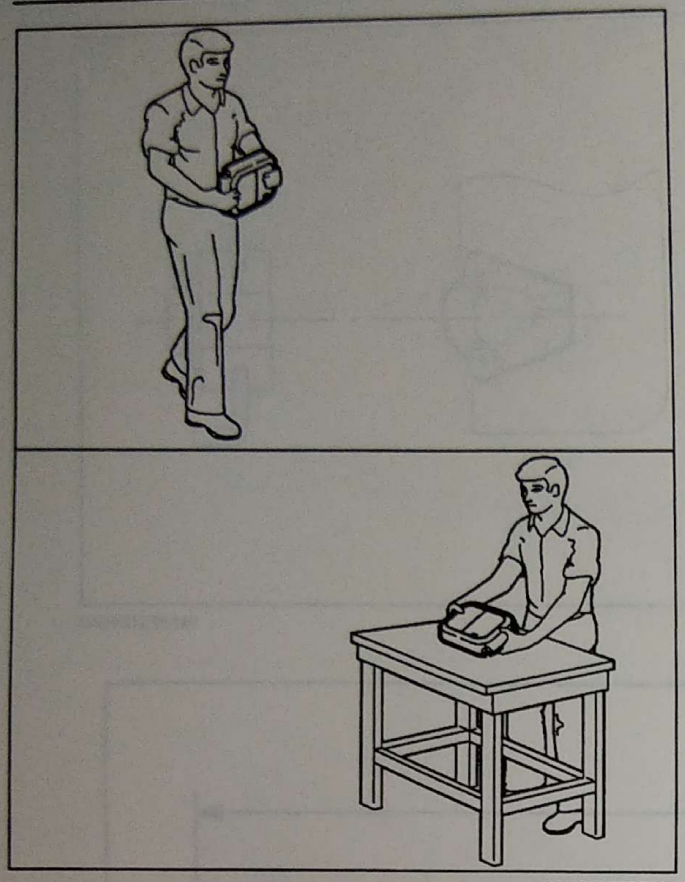

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INFLATOR MODULE – HANDLING/SHIPPING/ SCRAPPING

LIVE (UNDEPLOYED) INFLATOR MODULES

SERVICE PRECAUTIONS

CAUTION: WHEN PERFORMING SERVICE ON OR AROUND SIR COMPONENTS OR WIRING FOLLOW THE PROCEDURES LISTED TO TEMPORARILY DISABLE THE SIR SYSTEM. FAILURE TO FOLLOW PROCEDURE COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY OR OTHERWISE UNNEEDED SIR SYSTEM REPAIRS.

THE SENSING AND DIAGNOSTIC MODULE (SDM) CAN MAINTAIN SUFFICIENT VOLTAGE TO CAUSE A DEPLOYMENT FOR UP TO *10 MINUTES* AFTER THE KEY PAD HAS BEEN PLACED IN THE "LOCK" MODE, ALSO IF THE AUXILIARY BATTERY IS DISCONNECTED OR THE SIR "ENABLE/DISABLE" SWITCH IS PLACED IN THE "DISABLE" POSITION. MANY OF THE SERVICE PROCEDURES REQUIRE THE SIR "ENABLE/DISABLE" SWITCH TO BE PLACED IN THE "DISABLE POSITION" AND DISCONNECTION OF THE DEPLOYMENT LOOPS TO AVOID AN ACCIDENTAL DEPLOYMENT.

HANDLING AND STORAGE

Special care is necessary when handling and storing a live (undeployed) inflator module. The rapid gas generation produced during deployment of the air bag could cause the inflator module, or an object in front of the inflator module, to be thrown through the air in the unlikely event of an accidental deployment.

CAUTION: WHEN CARRYING A LIVE INFLATOR MODULE, MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. NEVER CARRY THE INFLATOR MODULE BY THE WIRES OR CONNECTOR ON THE UNDERSIDE OF THE MODULE. IN CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG WILL THEN DEPLOY WITH MINIMAL CHANCE OF INJURY. ALSO, WHEN PLACING A LIVE INFLATOR MODULE ON A BENCH OR OTHER SURFACE, ALWAYS FACE THE BAG AND TRIM COVER UP AND AWAY FROM THE SURFACE. NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE FACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE AIR BAG TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY MAY RESULT.

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INFLATOR MODULE SHIPPING PROCEDURES FOR LIVE (UNDEPLOYED) INFLATOR MODULES

The U.S. Department of Transportation (DOT) classifies an undeployed inflator module as a Class B or Class C (depending on size) explosive power device. However, under exemptions issued by the DOT, manufacturers of inflator modules may transport them within the continental United States as flammable solids.

Saturn Retailers have been made a "party to" these exemptions and may also transport inflator modules as flammable solids. As recipients of packages shipped under the exemption, Retailers who receive inflator modules from Saturn may re-ship them under the exemption as well.

Saturn must retain copies of the DOT exemptions specifying the package and shipping requirements for inflator modules (DOT E-8214 and DOT E-8236). Failure to retain copies and to comply with their provisions will result in civil penalties of up to $10,000 per violation or criminal penalties of up to $25,000 per violation and imprisonment.

The DOT exemptions are updated at the expiration date as specified on each exemption. Saturn Retailers are responsible for obtaining an up-to-date copy from the DOT for each exemption.

When it is necessary to return an undeployed inflator module refer to additional packaging and shipping information relating specifically to the inflator module being replaced and perform the following steps:

1. Package the undeployed inflator module and a legible copy of the repair order detailing the reason for replacement in the same carton in which the service replacement inflator module was shipped. If the shipping carton is severely damaged obtain a new shipping carton.
2. Close the carton and secure it with packaging tape, following these rules.
   - DO NOT STAPLE THE CARTON.
   - DO NOT COVER THE MARKINGS ON THE CARTON.
   - DO NOT COVER ANY PORTION OF THE RED AND WHITE FLAMMABLE SOLID LABEL.
3. Secure the return address label to the carton.
4. Complete the shipping papers, including the following information (refer to):
   - Proper shipping name
   - Hazard class
   - UN number
   - DOT exemption number
   - Technical name of material
   - Emergency response information

INFLATOR MODULE SCRAPPING PROCEDURES

During the course of a vehicle's useful life, certain situations may arise which will necessitate the disposal of a live (undeployed) inflator module.

Before a live (undeployed) inflator module can be disposed of it must be deployed. Live (undeployed) inflator modules must not be disposed of through normal refuse channels.

CAUTION: FAILURE TO FOLLOW PROPER SIR INFLATOR MODULE DISPOSAL PROCEDURES CAN RESULT IN AIR BAG DEPLOYMENT WHICH MAY CAUSE PERSONAL INJURY. UNDEPLOYED INFLATOR MODULES MUST NOT BE DISPOSED OF THROUGH NORMAL REFUSE CHANNELS.

THE UNDEPLOYED INFLATOR MODULE CONTAINS SUBSTANCES THAT CAN CAUSE SEVERE ILLNESS OR PERSONAL INJURY IF THE SEALED CONTAINER IS DAMAGED DURING DISPOSAL. DISPOSAL IN ANY MANNER INCONSISTENT WITH PROPER PROCEDURES MAY BE A VIOLATION OF FEDERAL, STATE AND/OR LOCAL LAWS.

If a vehicle is the subject of a "Product Liability Report" related to the SIR system and is subject to a preliminary investigation, DO NOT DEPLOY the inflator module and DO NOT ALTER the SIR system in any manner. If a vehicle is the subject of a campaign affecting inflator modules, DO NOT DEPLOY the inflator module. Follow instructions in the campaign bulletin for proper disposition of the inflator module.

If an inflator module is replaced under warranty in any of the situations listed above, DO NOT DEPLOY the air bag.

Some vehicles equipped with SIR systems that have live (undeployed) inflator modules may have to be scrapped because they have completed their useful life or have been severely damaged in a non-deployment type accident. In situations which require deployment of a live (undeployed) inflator module, deployment may be accomplished inside or outside the vehicle. The method employed depends upon final disposition of the particular vehicle.

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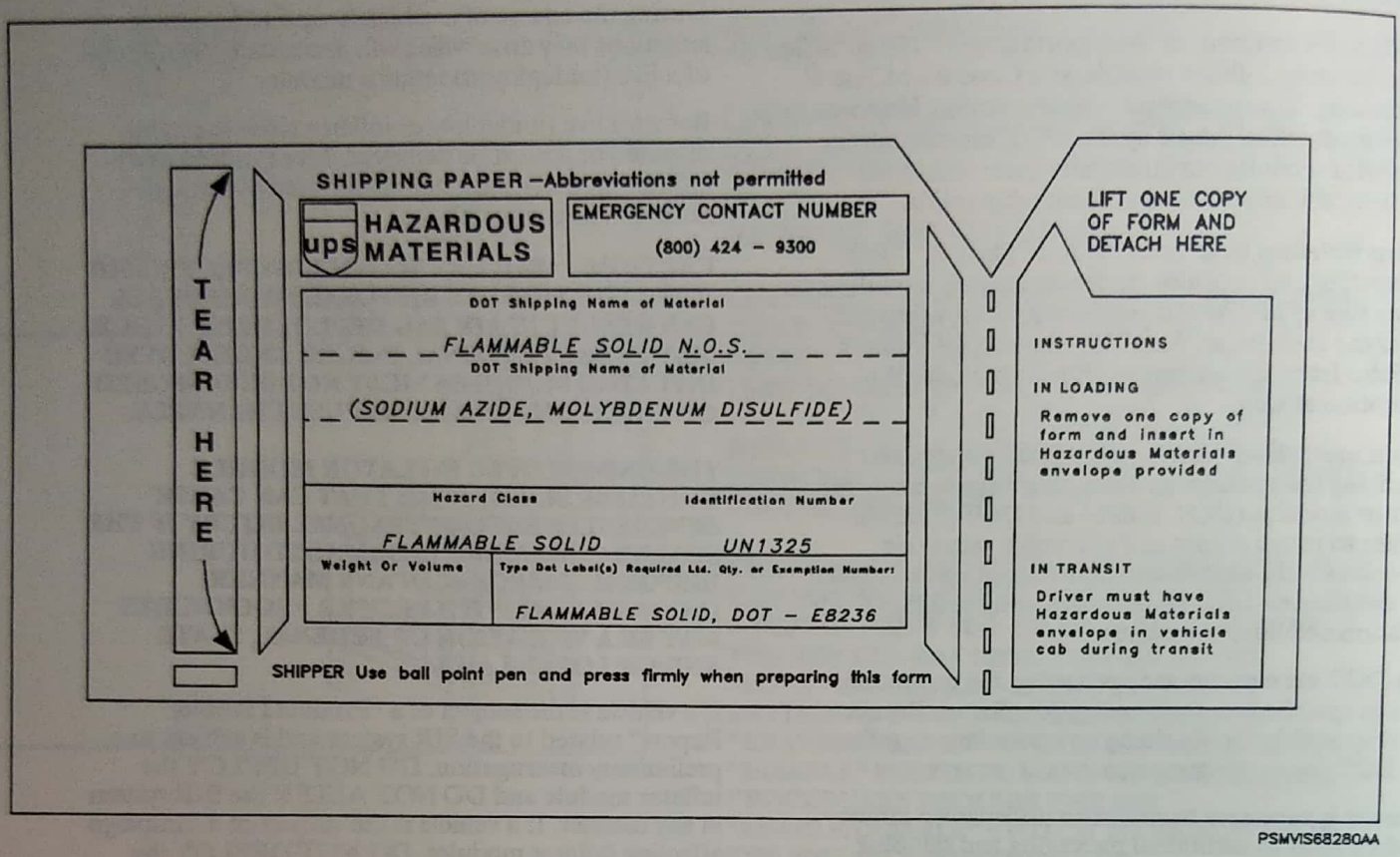
SHIPPING PAPER –Abbreviations not permitted
ups HAZARDOUS MATERIALS
EMERGENCY CONTACT NUMBER
(800) 424 – 9300
DOT Shipping Name of Material
FLAMMABLE SOLID N.O.S.
DOT Shipping Name of Material
(SODIUM AZIDE, MOLYBDENUM DISULFIDE)
Hazard Class
Identification Number
FLAMMABLE SOLID
UN1325
Weight Or Volume
Type Dot Label(s) Required Ltd. Qty. or Exemption Number:
FLAMMABLE SOLID, DOT – E8236
TEAR HERE
SHIPPER Use ball point pen and press firmly when preparing this form
LIFT ONE COPY OF FORM AND DETACH HERE
INSTRUCTIONS
IN LOADING
Remove one copy of form and insert in Hazardous Materials envelope provided
IN TRANSIT
Driver must have Hazardous Materials envelope in vehicle cab during transit

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For hazardous material label use the following information:

MODULE	DOT SHIPPING NAME OF MATERIAL
Driver	Sodium Azide, Molybdenum Disulfide
Passenger	Sodium Azide, Molybdenum Disulfide

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DEPLOYMENT INSIDE THE VEHICLE - DRIVER AND PASSENGER

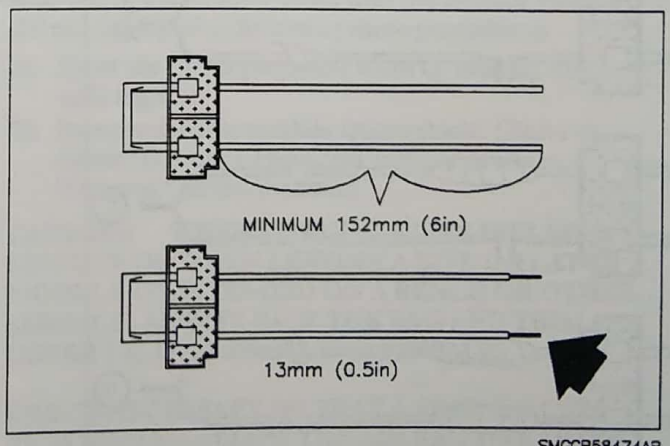
Deployment inside the vehicle is proper when the vehicle is to be destroyed or salvaged for component parts. This includes, but is limited to, the following situations.

- Where the vehicle has completed its useful life.
- Where the vehicle has been damaged beyond repair in a non-deployment-type accident.
- Where the vehicle has been stripped or damaged beyond repair in a theft.
- Where the vehicle will be salvaged for component parts to be used on a different vehicle identification number as opposed to being rebuilt as the same vehicle identification number. This is done to ensure SIR system integrity since ONLY NEW SIR COMPONENTS MAY BE USED IN SERVICING AN SIR EQUIPPED VEHICLE. Never use SIR components from another vehicle. Always replace SIR components with NEW COMPONENTS.

CAUTION: FAILURE TO FOLLOW PROCEDURES IN THE ORDER LISTED COULD RESULT IN PERSONAL INJURY. NEVER CONNECT DEPLOYMENT WIRES TO ANY POWER SOURCE BEFORE CONNECTING DEPLOYMENT WIRES TO THE INFLATOR MODULE LEADS. DEPLOYMENT WIRES SHALL REMAIN SHORTED AND NOT BE CONNECTED TO A POWER SOURCE UNTIL THE AIR BAG IS TO BE DEPLOYED. THE INFLATOR MODULE WILL IMMEDIATELY DEPLOY THE AIR BAG WHEN A POWER SOURCE IS CONNECTED TO IT. WEAR SAFETY GLASSES THROUGHOUT THIS ENTIRE DEPLOYMENT AND DISPOSAL PROCEDURE.

Procedures for deployment of a live (undeployed) inflator module within the vehicle are as follows:

1. Lower driver and passenger windows. Place key pad in the "LOCK" mode.
2. Check that the driver inflator module is secured to the steering wheel and that the passenger inflator module is secured to the instrument panel.
3. Remove all loose objects from front seat and inflator module covers.
4. Disable the SIR System. (Refer to "Disabling the SIR System" in this manual.)
5. Cut the two wires of each yellow two-way connector away from the vehicle harness leaving at least 150 mm (6 in.) of wire at the connector.
6. Strip 15 mm (1/2 in.) of insulation off both leads from the connector.



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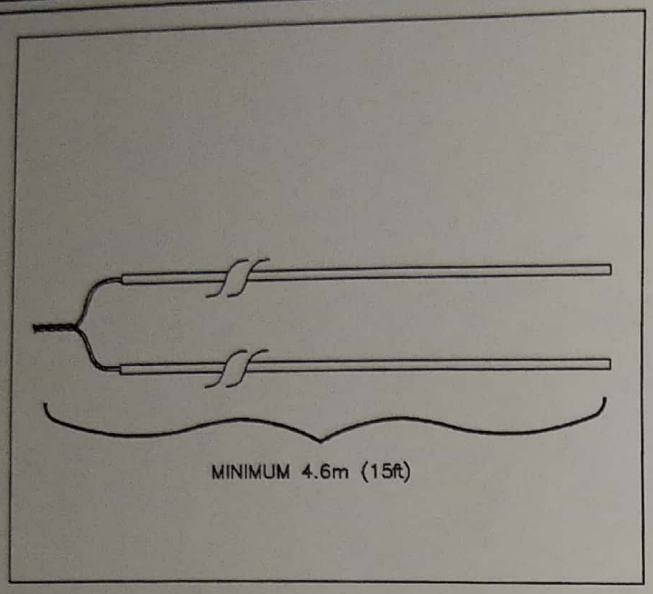
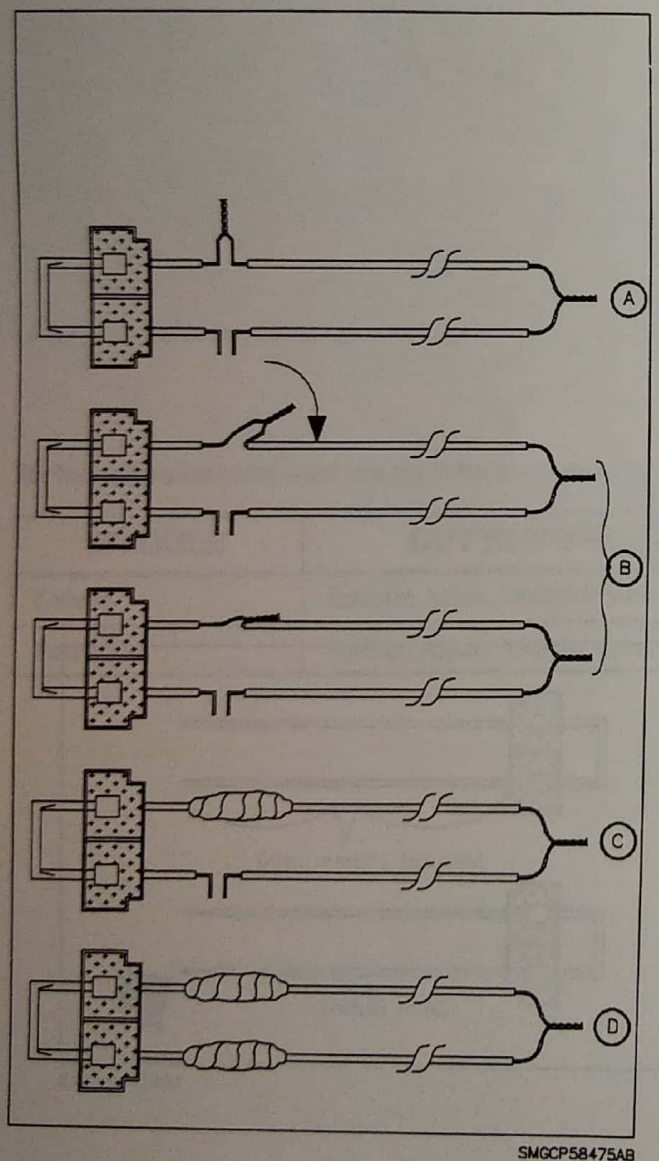


7. Cut two 5 m (15 ft.) deployment wires from multi-strand wire .8 mm (18 gauge) or thicker. These deployment wires will be used to fabricate a deployment harness.



8. Strip 15 mm (1/2 in.) of insulation off both ends of each deployment wire.
9. Short the two deployment wires by twisting together one end from each. Deployment wires shall remain shorted and not be connected to a power source until the air bag is to be deployed.
10. Twist together one connector wire lead to one deployment wire. The connection should be mechanically secure.
11. Bend twisted connection, (made in step 10), flat and wrap tightly with electrical tape to insulate and secure.
12. Twist together, bend and tape the remaining connector wire lead to the remaining deployment wire as in steps 10 and 11.

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13. Connect the deployment harness to the yellow two-way connector on the right of the steering column (for driver's side), or yellow two-way connector under lower left side of I/P (for passenger side).
14. Verify that the vehicle is clear of all people and loose or flammable objects.
15. Stretch the deployment harness wires from the vehicle to their full length.

CAUTION: WHEN THE AIR BAG DEPLOYS, THE RAPID GAS EXPANSION WILL CREATE A SUBSTANTIAL NOISE. NOTIFY ALL PEOPLE IN THE IMMEDIATE AREA OF YOUR INTENTION TO DEPLOY THE INFLATOR MODULE.

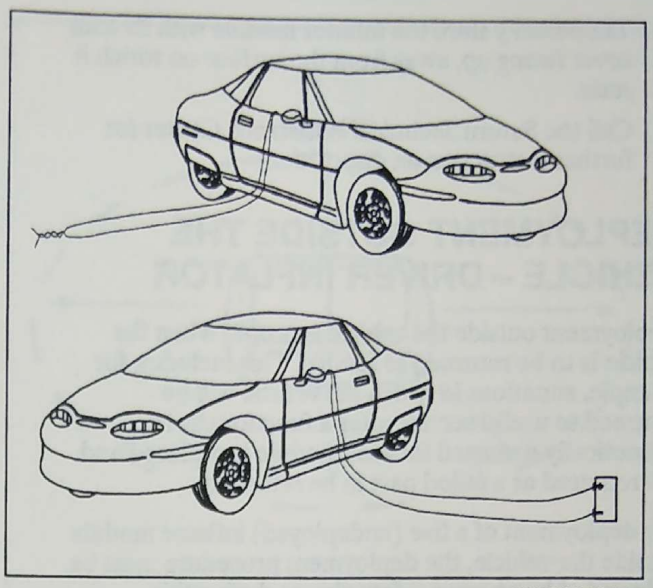
16. Notify all people in the immediate area of your intention to deploy the inflator module as the deployment will be accompanied by a substantial noise which may startle the uninformed.
17. Separate the two ends of the deployment wires that were twisted together in step 9.

CAUTION: DEPLOYMENT WIRES SHALL REMAIN SHORTED AND NOT BE CONNECTED TO A POWER SOURCE UNTIL THE AIR BAG IS TO BE DEPLOYED. THE INFLATOR MODULE WILL IMMEDIATELY DEPLOY THE AIR BAG WHEN A POWER SOURCE IS CONNECTED TO IT. CONNECTING THE DEPLOYMENT WIRES TO THE POWER SOURCE SHOULD ALWAYS BE THE FINAL STEP IN THE INFLATOR MODULE DEPLOYMENT PROCEDURE. FAILURE TO FOLLOW PROCEDURES IN THE ORDER LISTED COULD RESULT IN PERSONAL INJURY.

18. Connect the deployment wires to a power source to deploy the inflator module. Recommended application: 12 volts minimum, 2 amps minimum. A car battery is suggested.
19. Put on a pair of shop gloves and safety glasses to protect your hands and eyes from possible irritation when handling the deployed inflator module.

CAUTION: SAFETY PRECAUTIONS MUST BE OBSERVED WHEN HANDLING A DEPLOYED INFLATOR MODULE. AFTER DEPLOYMENT, THE METAL SURFACES OF THE INFLATOR MODULE WILL BE VERY HOT. ALLOW THE INFLATOR MODULE TO COOL BEFORE HANDLING ANY METAL PORTION OF IT. DO NOT PLACE THE HOT DEPLOYED INFLATOR MODULE NEAR ANY FLAMMABLE OBJECTS. FAILURE TO FOLLOW PROCEDURES COULD RESULT IN FIRE OR PERSONAL INJURY.

After an inflator module has been deployed, the metal canister and surrounding areas of the inflator module will be very hot. Do not touch the metal areas of the inflator module for about 10 minutes after deployment. If the deployed inflator module must be moved before it is cool, wear gloves and handle by the air bag or vinyl trim.



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After the inflator module has been deployed, the surface of the air bag may contain a powdery residue. This powder consists primarily of corn starch (used to prevent bag from adhering to itself over the life of the product) and by-products of the chemical reaction. Sodium hydroxide dust (similar to lye soap) is produced as a by−product of the deployment reaction. The sodium hydroxide then quickly reacts with atmospheric moisture and is converted to sodium carbonate and sodium bicarbonate (baking soda). Therefore, it is unlikely that sodium hydroxide will be present after deployment. As a precaution, however, gloves and safety glasses are recommended to prevent any possible irritation of the skin or eyes.

20. Wash your hands with mild soap and water afterwards.
21. In the unlikely event that the inflator module does not deploy after following this procedure, proceed with steps 22 through 25.

IMPORTANT: The remaining steps are to be followed in the unlikely event that the inflator module did not deploy after following these procedures.

22. Short the two deployment wires by twisting the ends together.
23. Remove inflator module from vehicle. (Refer to either "Driver or Passenger Inflator Module Removal," in this manual.)

CAUTION: WHEN STORING A LIVE INFLATOR MODULE OR WHEN LEAVING A LIVE INFLATOR MODULE UNATTENDED ON A BENCH OR OTHER SURFACE, ALWAYS FACE THE BAG AND TRIM COVER UP, AWAY FROM THE SURFACE.

THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE AIR BAG TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. FAILURE TO FOLLOW PROCEDURES COULD RESULT IN PERSONAL INJURY.

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24. Temporarily store the inflator module with its trim cover facing up, away from the surface on which it rests.
25. Call the Saturn Technical Assistance Center for further instruction on disposition.

DEPLOYMENT OUTSIDE THE VEHICLE – DRIVER INFLATOR

Deployment outside the vehicle is proper when the vehicle is to be returned to service. This includes, for example, situations in which the vehicle will be returned to useful service after a functionally or cosmetically damaged inflator module is replaced and not required as a failed part to be returned.

For deployment of a live (undeployed) inflator module outside the vehicle, the deployment procedure must be followed. Always wear safety glasses during this deployment procedure until a deployed inflator module is scrapped or until an undeployed inflator module is shipped. Before performing the procedures you should be familiar with servicing the SIR system and with proper handling of the SIR inflator module.

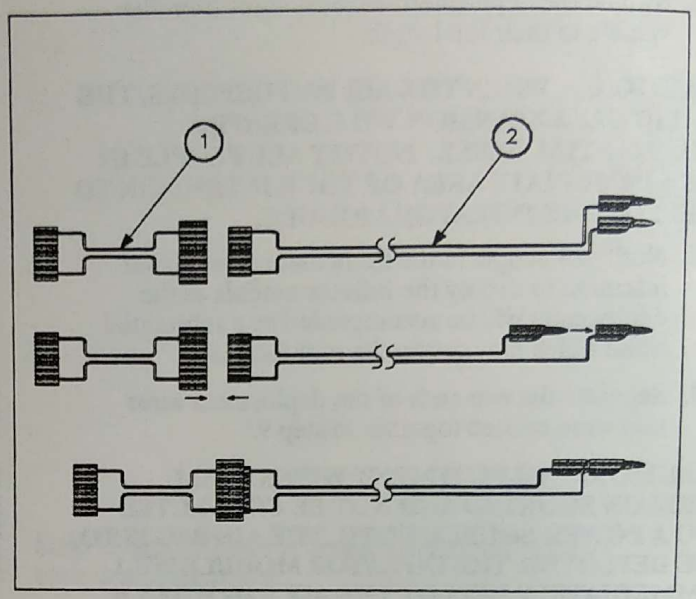
The following procedure requires use of Deployment Harness SA 9207Z and appropriate pigtail adapter.

CAUTION: FAILURE TO FOLLOW PROCEDURES IN THE ORDER LISTED MAY RESULT IN PERSONAL INJURY. NEVER CONNECT DEPLOYMENT HARNESS TO ANY POWER SOURCE BEFORE CONNECTING DEPLOYMENT HARNESS TO THE INFLATOR MODULE. DEPLOYMENT HARNESS SHALL REMAIN SHORTED AND NOT BE CONNECTED TO A POWER SOURCE UNTIL THE AIR BAG IS TO BE DEPLOYED. THE INFLATOR MODULE WILL IMMEDIATELY DEPLOY THE AIR BAG WHEN A POWER SOURCE IS CONNECTED TO IT. WEAR SAFETY GLASSES THROUGHOUT THIS ENTIRE DEPLOYMENT AND DISPOSAL PROCEDURE.

1. Put on safety glasses.
2. Inspect universal deployment harness and appropriate pigtail adapter for damage. If harness or pigtail is damaged, discard and obtain a replacement.

CAUTION: DEPLOYMENT WIRES SHALL REMAIN SHORTED AND NOT BE CONNECTED TO A POWER SOURCE UNTIL THE AIR BAG IS TO BE DEPLOYED. THE INFLATOR MODULE WILL IMMEDIATELY DEPLOY THE AIR BAG WHEN A POWER SOURCE IS CONNECTED TO IT. CONNECTING THE DEPLOYMENT WIRES TO THE POWER SOURCE SHOULD ALWAYS BE THE FINAL STEP IN THE INFLATOR MODULE DEPLOYMENT PROCEDURE. FAILURE TO FOLLOW PROCEDURES IN THE ORDER LISTED COULD RESULT IN PERSONAL INJURY.

3. Short the two universal deployment harness leads together by fully seating one banana plug into the other. Universal deployment harness shall remain shorted and not be connected to a power source until the air bag is to be deployed.
4. Connect the appropriate pigtail adapter to the universal deployment harness.



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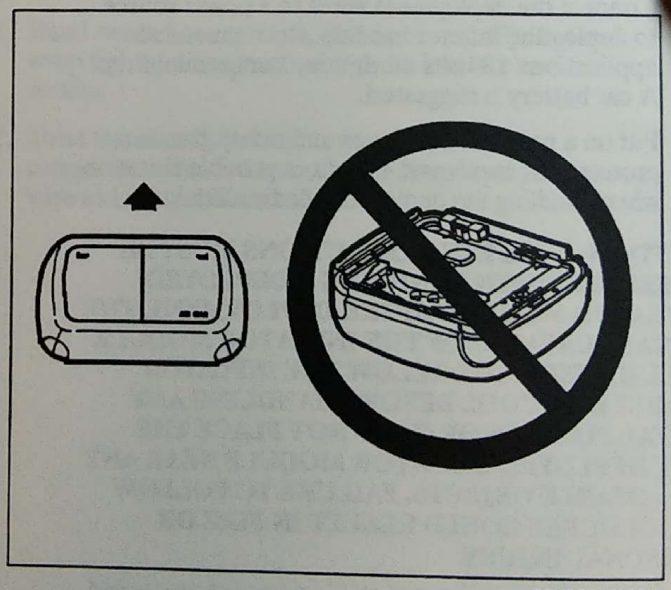
① Pigtail Adapter: EV 9720Z

② Universal Deployment Harness: SA 9207Z

5. Remove inflator module from vehicle. (Refer to "Driver Inflator Module Removal," in this manual.)



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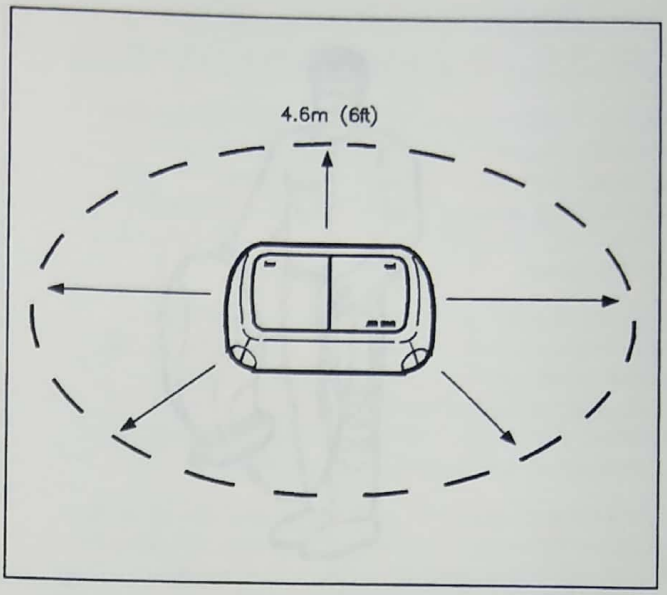
6. Temporarily place the inflator module on a work bench or other surface away from all loose or flammable objects and with its soft vinyl trim cover facing up, away from the surface.

7. Clear a space on the ground approximately six feet in diameter where the inflator module is to be deployed. A paved outdoor location where there is no activity and sufficient ventilation is recommended. Make certain that no loose or flammable objects are within the deployment area.
8. Place the inflator module with a soft vinyl trim cover facing up on the ground in the space just cleared.



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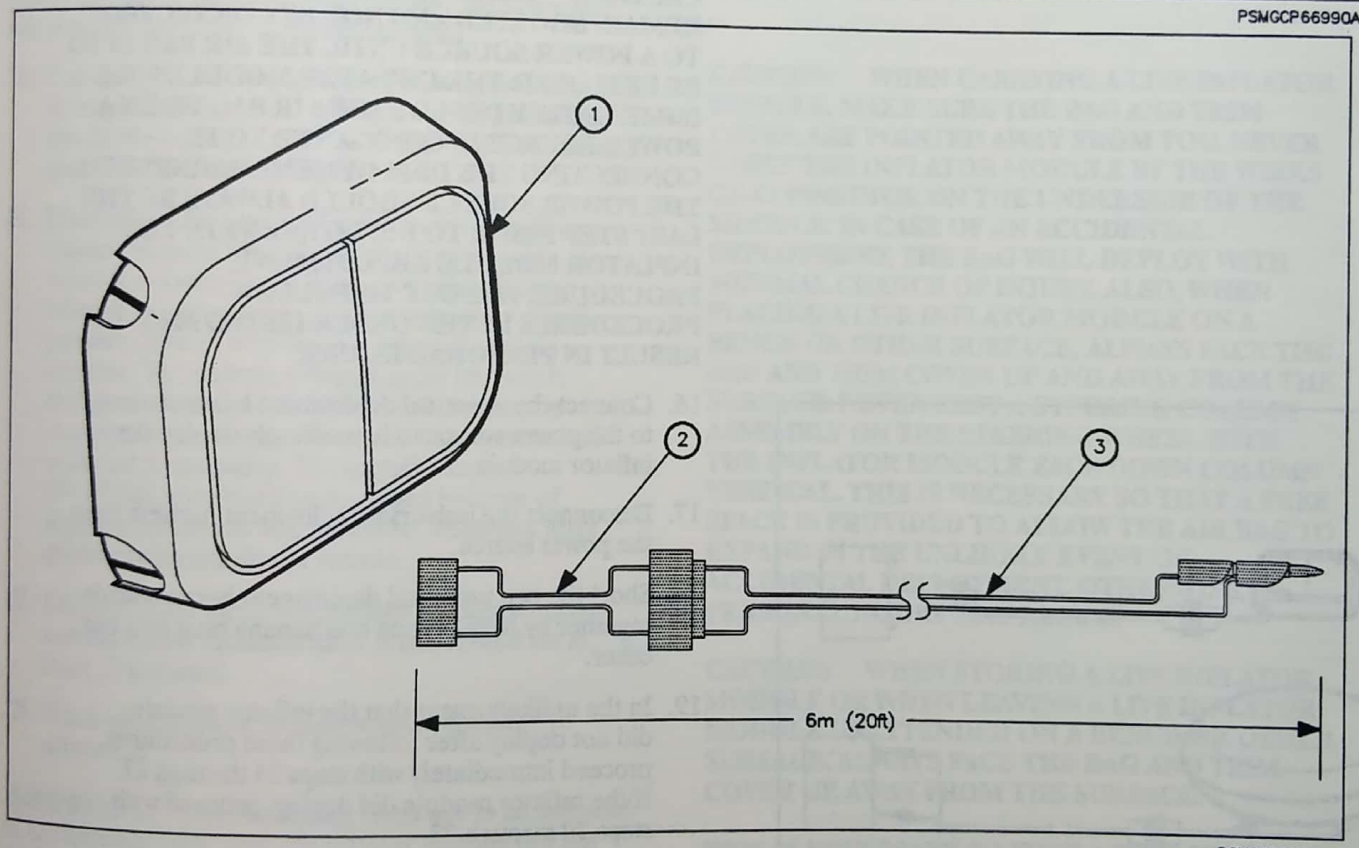

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① Driver Inflator Module ② Pigtail Adapter: EV 9720Z ③ Universal Deployment Harness: SA 9207Z

9. Stretch the universal deployment harness and pigtail adapter from the inflator module to its full length.
10. Place a power source near the shorted end of the deployment harness. (Recommended application: 12 volts minimum, 2 amps minimum. A car battery is suggested.)
11. Connect the SIR inflator module to the pigtail adapter on the universal deployment harness.

NOTICE: Make sure that the pigtail adapter connector is fully seated into the inflator module connector. Failure to fully seat the connectors may leave the shorting bar located in the inflator module connector active and may result in non-deployment of the inflator module.

12. Verify that the area around the inflator module is clear of all people and loose or flammable objects.
13. Verify that the inflator module is resting with its soft vinyl trim cover facing up.

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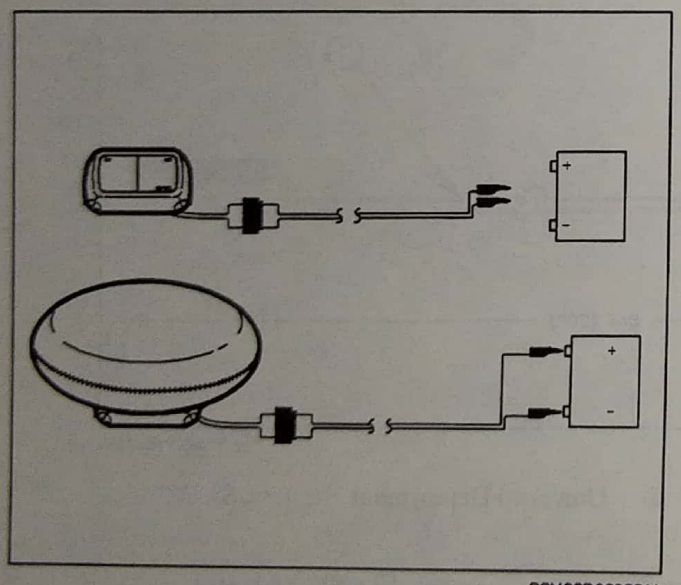
CAUTION: WHEN THE AIR BAG DEPLOYS, THE RAPID GAS EXPANSION WILL CREATE A SUBSTANTIAL NOISE. NOTIFY ALL PEOPLE IN THE IMMEDIATE AREA OF YOUR INTENTION TO DEPLOY THE INFLATOR MODULE.

IMPORTANT: When the air bag deploys, the inflator module may jump approximately one foot in height. This is a normal reaction of the inflator module to the force of the rapid gas expansion inside the air bag.

14. Notify all people in the immediate area of your intention to deploy the inflator module as the deployment will be accompanied by a substantial noise which may startle the uninformed.
15. Separate the two banana plugs on the universal deployment harness that were shorted together in step 3. Refer to illustration above.

CAUTION: DEPLOYMENT HARNESS SHALL REMAIN SHORTED AND NOT BE CONNECTED TO A POWER SOURCE UNTIL THE AIR BAG IS TO BE DEPLOYED. THE INFLATOR MODULE WILL IMMEDIATELY DEPLOY THE AIR BAG WHEN A POWER SOURCE IS CONNECTED TO IT. CONNECTING THE DEPLOYMENT HARNESS TO THE POWER SOURCE SHOULD ALWAYS BE THE LAST STEP PRIOR TO DEPLOYMENT IN THE INFLATOR MODULE DEPLOYMENT PROCEDURE. FAILURE TO FOLLOW PROCEDURES IN THE ORDER LISTED MAY RESULT IN PERSONAL INJURY.



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16. Connect the universal deployment harness wires to the power source to immediately deploy the inflator module.
17. Disconnect the universal deployment harness from the power source.
18. Short the two universal deployment harness leads together by fully seating one banana plug into the other.
19. In the unlikely event that the inflator module did not deploy after following these procedures, proceed immediately with steps 24 through 27. If the inflator module did deploy, proceed with steps 20 through 23.

CAUTION: SAFETY PRECAUTIONS MUST BE OBSERVED WHEN HANDLING A DEPLOYED INFLATOR MODULE. AFTER DEPLOYMENT, THE METAL SURFACES OF THE INFLATOR MODULE WILL BE VERY HOT. ALLOW THE INFLATOR MODULE TO COOL BEFORE HANDLING ANY METAL PORTION OF IT. DO NOT PLACE THE HOT DEPLOYED INFLATOR MODULE NEAR ANY FLAMMABLE OBJECTS. FAILURE TO FOLLOW PROCEDURES MAY RESULT IN FIRE OR PERSONAL INJURY.

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After an inflator module has been deployed, the metal canister and surrounding areas of the inflator module will be very hot. Do not touch the metal areas of the inflator module for about 10 minutes after deployment. If the deployed inflator module must be moved before it is cool, wear gloves and handle by the air bag or vinyl trim.

After the inflator module has been deployed, the surface of the air bag may contain a powdery residue. This powder consists primarily of corn starch (used to prevent bag from adhering to itself over the life of the product) and byproducts of the chemical reaction. Sodium hydroxide dust (similar to lye soap) is produced as a byproduct of the deployment reaction. The sodium hydroxide then quickly reacts with the atmospheric moisture and is converted to sodium carbonate and sodium bicarbonate (baking soda). Therefore, it is unlikely that sodium hydroxide will be present after deployment. As a precaution, however, gloves and safety glasses are recommended to prevent any possible irritation of the skin or eyes.

20. Put on a pair of shop gloves to protect your hands from possible irritation and heat when handling the deployed inflator module. Safety glasses should also be worn to protect your eyes.

21. Disconnect the pigtail adapter from the inflator module as soon after deployment as possible to avoid the possibility of damage to the pigtail adapter or universal deployment harness due to possible contact with the hot inflator module canister. The universal deployment harness is designed to be reused. It should, however, be inspected for damage after each deployment and replaced if necessary. The pigtail adapter, EV 9720Z, may become damaged because of high temperatures and should be discarded after deployment outside the vehicle.

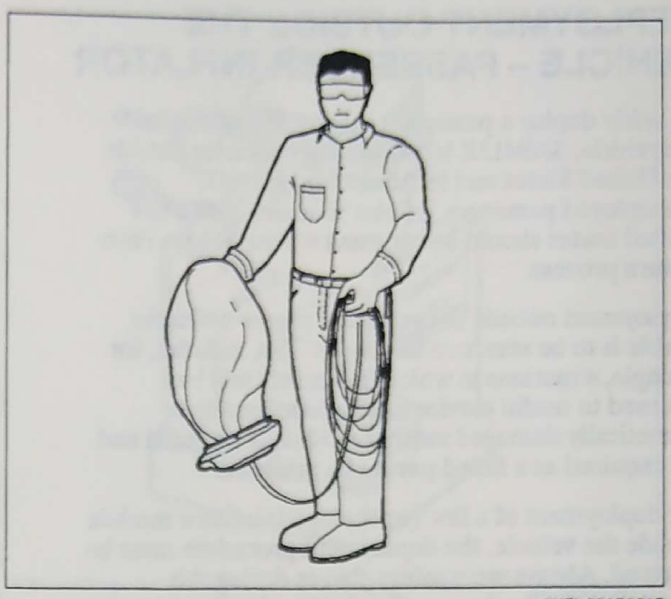
22. Dispose of the deployed inflator module through normal refuse channels after it has cooled for at least 10 minutes.

23. Wash your hands with mild soap and water afterward.

IMPORTANT: The remaining steps are to be followed in the unlikely event that the inflator module did not deploy after following these procedures.

24. Make certain that the universal deployment harness has been disconnected from the power source and that its two banana plugs have been shorted together by fully seating on banana plug into the other.

25. Disconnect the pigtail adapter from the inflator module.



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CAUTION: WHEN CARRYING A LIVE INFLATOR MODULE, MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. NEVER CARRY THE INFLATOR MODULE BY THE WIRES OR CONNECTOR ON THE UNDERSIDE OF THE MODULE. IN CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG WILL DEPLOY WITH MINIMAL CHANCE OF INJURY. ALSO, WHEN PLACING A LIVE INFLATOR MODULE ON A BENCH OR OTHER SURFACE, ALWAYS FACE THE BAG AND TRIM COVER UP AND AWAY FROM THE SURFACE. NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE FACE DOWN COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE AIR BAG TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY MAY RESULT

CAUTION: WHEN STORING A LIVE INFLATOR MODULE OR WHEN LEAVING A LIVE INFLATOR MODULE UNATTENDED ON A BENCH OR OTHER SURFACE, ALWAYS FACE THE BAG AND TRIM COVER UP, AWAY FROM THE SURFACE.

THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE AIR BAG TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. FAILURE TO FOLLOW PROCEDURES COULD RESULT IN PERSONAL INJURY.

26. Temporarily store the inflator module with its soft vinyl trim cover facing up, away from the surface on which it rests.

27. Call the Saturn Technical Assistance Center for further instruction on disposition.

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DEPLOYMENT OUTSIDE THE VEHICLE – PASSENGER INFLATOR

To safely deploy a passenger inflator module outside the vehicle, SA9413Z is required in countries outside the United States and in Alaska and Hawaii. Undeployed passenger inflator modules within the United States should be returned via the Saturn Parts Return process.

Deployment outside the vehicle is proper when the vehicle is to be returned to service. This includes, for example, situations in which the vehicle will be returned to useful service after a functionally or cosmetically damaged inflator module is replaced and not required as a failed part to be returned.

For deployment of a live (undeployed) inflator module outside the vehicle, the deployment procedure must be followed. Always wear safety glasses during this deployment procedure until a deployed inflator module is scrapped or until an undeployed inflator module is shipped. Before performing the procedures you should be familiar with servicing the SIR system and with proper handling of the SIR inflator module.

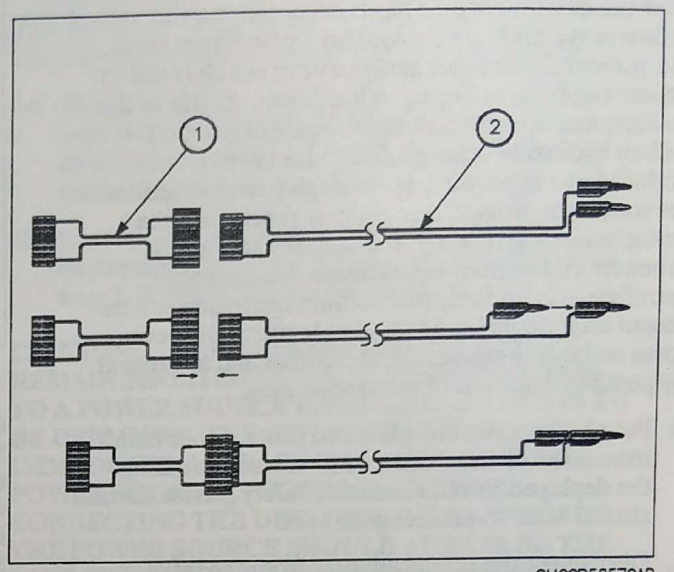
The following procedure requires use of Deployment Harness SA 9207Z, SA9413Z and appropriate pigtail adapter.

CAUTION: FAILURE TO FOLLOW PROCEDURES IN THE ORDER LISTED MAY RESULT IN PERSONAL INJURY. NEVER CONNECT DEPLOYMENT HARNESS TO ANY POWER SOURCE BEFORE CONNECTING DEPLOYMENT HARNESS TO THE INFLATOR MODULE. DEPLOYMENT HARNESS SHALL REMAIN SHORTED AND NOT BE CONNECTED TO A POWER SOURCE UNTIL THE AIR BAG IS TO BE DEPLOYED. THE INFLATOR MODULE WILL IMMEDIATELY DEPLOY THE AIR BAG WHEN A POWER SOURCE IS CONNECTED TO IT. WEAR SAFETY GLASSES THROUGHOUT THIS ENTIRE DEPLOYMENT AND DISPOSAL PROCEDURE.

1. Put on safety glasses.
2. Inspect universal deployment harness and appropriate pigtail adapter for damage. If harness or pigtail is damaged, discard and obtain a replacement.

CAUTION: DEPLOYMENT WIRES SHALL REMAIN SHORTED AND NOT BE CONNECTED TO A POWER SOURCE UNTIL THE AIR BAG IS TO BE DEPLOYED. THE INFLATOR MODULE WILL IMMEDIATELY DEPLOY THE AIR BAG WHEN A POWER SOURCE IS CONNECTED TO IT. CONNECTING THE DEPLOYMENT WIRES TO THE POWER SOURCE SHOULD ALWAYS BE THE FINAL STEP IN THE INFLATOR MODULE DEPLOYMENT PROCEDURE. FAILURE TO FOLLOW PROCEDURES IN THE ORDER LISTED COULD RESULT IN PERSONAL INJURY.

3. Short the two universal deployment harness leads together by fully seating one banana plug into the other. Universal deployment harness shall remain shorted and not be connected to a power source until the air bag is to be deployed.
4. Connect the appropriate pigtail adapter to the universal deployment harness.



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① Pigtail Adapter 9207Z–1

② Universal Deployment Harness: SA 9207Z–A

5. Remove inflator module from vehicle. (Refer to "Passenger Inflator Module Removal," in this manual.)
6. Temporarily place the inflator module on a work bench or other surface away from all loose or flammable objects and with its soft vinyl trim cover facing up, away from the surface.
7. Clear a space on the ground approximately six feet in diameter where the inflator module is to be deployed. A paved outdoor location where there is no activity and sufficient ventilation is recommended. Make certain that no loose or flammable objects are within the deployment area.

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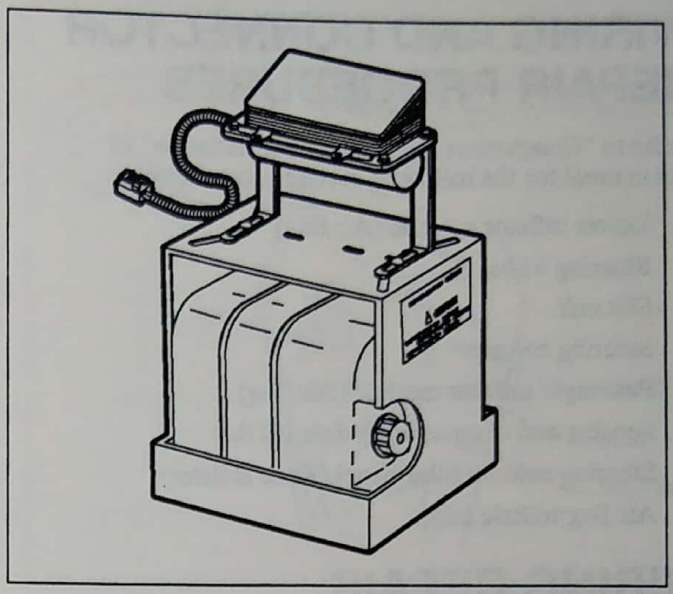
8. Fill the plastic reservoir in the fixture with water or sand. This is necessary to provide sufficient stabilization of the fixture during deployment.

9. Attach the passenger inflator module in the Passenger Side SIR Module Deployment Fixture using the Flange/Arm Mounting Method as shown in the illustration. SECURELY HAND TIGHTEN ALL FASTENERS PRIOR TO DEPLOYMENT.

NOTICE: If the fasteners are damaged after deployment, use replacement bolt, Saturn Part Number 11505192, and nut, Saturn Part Number 11507053.

10. Continue with the same procedures as detailed for DEPLOYMENT OUTSIDE THE VEHICLE - DRIVER INFLATOR starting with Step 9.



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WIRING AND CONNECTOR REPAIR PROCEDURES

Refer to "Component Removal and Installation" in this manual for the following service procedures:

- Driver inflator module (Air Bag)
- Steering wheel
- SIR coil
- Steering column
- Passenger inflator module (Air Bag)
- Sensing and diagnostic module (SDM)
- Steering column filler panel (Knee Bolster)
- Air Bag telltale lamp

WIRING REPAIR

Wiring repair procedure on the supplemental inflatable restraint (SIR) system are critical due to the sensitive nature of the circuitry. *These instructions must be followed whenever servicing the SIR system wiring.*

NOTICE: Always disable the SIR system when making wire repairs.

SIR CONNECTOR REPAIR

If any connector or terminal in the SIR wire harness (except pigtails) is damaged, the component should be repaired using the appropriate connector or lead kit. In addition, the sealed splices listed on the following page, must be used for all wire repair. The splice crimping tool, which is color keyed to match the splices from the Saturn Repair Kit, must be used to apply these splices.

NOTICE: The terminals in the SIR system are made of a special metal to provide necessary contact integrity for the sensitive, low energy circuits. Do not substitute any other terminals for those in the lead kits.

SIR WIRE PIGTAIL REPAIR

If the wiring pigtail (a wire or wires attached directly to the device, not by a connector) is damaged, the entire component (with pigtail) must be replaced. Examples of "pigtail" components are the passenger inflator module and the SIR coil assembly. Absolutely no wire, connector or terminal repairs are to be attempted on these components.

SIR WIRE REPAIR

If any wire except the pigtail is damaged, the wire should be repaired by splicing in a new section of wire of the same gauge size (.5, .8, 1.0, etc.). The sealed splices and splice crimping tool from Saturn repair kit SA 9138Z must be used for these repairs. The following wiring repair procedures must be used to ensure the integrity of the sealed splice application.

1. OPEN THE HARNESS

If the harness is taped, remove the tape. To avoid wire insulation damage use a sewing "seam ripper" (available from sewing supply stores) to cut open the harness. The crimp and sealed splice sleeves may be used only to form a one-to-one splice.

2. CUT THE WIRE

Begin by cutting as little wire off the harness as possible. You may need the extra length of wire later if you decide to cut more wire to change the location of a splice. You may have to adjust splice locations to make certain that each splice is at least 1.5 in. (40 mm) away from other splices, harness branches, or connectors.

3. STRIP THE INSULATION

NOTICE: The following procedures must be followed in the order listed. If wire strands are damaged, the procedure must be repeated until a clean strip with all wire strands intact is obtained.

If it is necessary to add a length of wire to the existing harness, be certain to use the same size as the original wire.

To find the correct wire size either find the wire on the schematic and convert the metric size to the equivalent AWG size or use an AWG wire gage (refer to chart on next page).

If unsure about the wire size, begin with the largest opening in the wire stripper and work down until achieving a clean strip of the insulation. Strip approximately 5/16 in. (10 mm) of insulation from each wire to be spliced. Be careful to avoid nicking or cutting any of the strands. Check the stripped wire for nicks or cut strands. If the wire is damaged, repeat this procedure after removing the damaged section.

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4. SELECT AND POSITION THE SPLICE SLEEVE

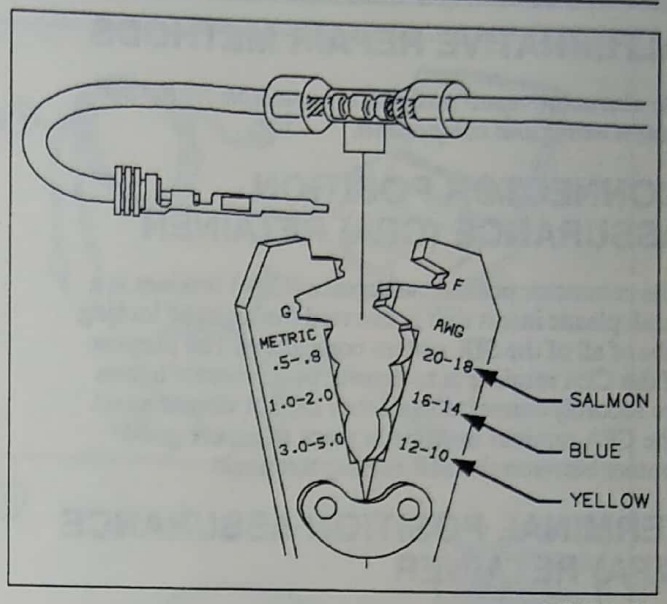
Wire Size (AWG)	22	20	18	16	14	12	10
Wire Size (sq. mm)	.35	.5	.8	1.0	2.0	3.0	5.0
Part Number*							
217670[1] 12089189[2]	— Salmon —						
217671[1] 12089190[2]				— Blue —			
217672[1] 12089191[2]						— Yellow —	

*Part of Saturn Electrical Tool Kit
1 - OTC Part Number
2 - Packard Electric Part Number

Select the proper sealed splice sleeve according to wire size. The splice sleeves and tool nests are color coded (see chart).

Using the splice crimp tool position the splice sleeve in the proper color nest of the hand crimp tool. Place the splice sleeve in the nest so that the crimp falls midway between the end of the barrel and the stop.

The sleeve has a stop in the middle of the barrel to prevent the wire from going further. Close the hand crimper handles slightly to hold the splice sleeve firmly in the proper nest.



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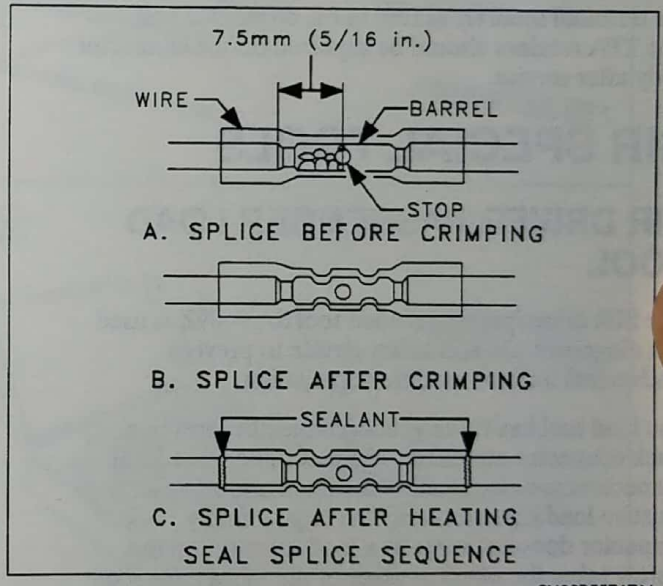
5. INSERT WIRES INTO SPLICE SLEEVE AND CRIMP

Insert the wire into the splice sleeve until it hits the barrel stop and close the handles of the splice crimp tool tightly until the crimper handles open when released.

The crimper handles will not open until the proper amount of pressure is applied to the splice sleeve. Repeat steps 4 and 5 for opposite end of the splice.



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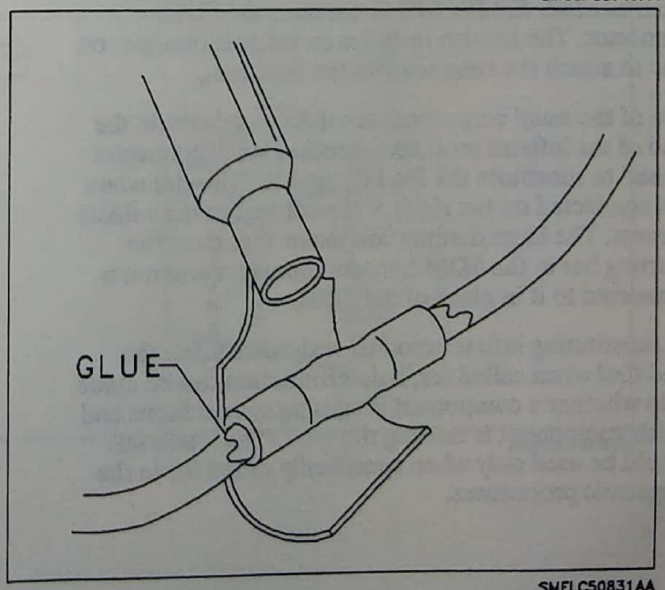
6. SHRINK THE INSULATION AROUND THE SPLICE

CAUTION: DO NOT USE A MATCH OR AN OPEN FLAME TO APPLY HEAT TO SPLICE.

Using the Ultratorch®, apply heat where the barrel is crimped.

Gradually move the heat barrel to the open end of the tubing, shrinking the tubing completely as the heat is moved along the insulation. A small amount of sealant will come out of the end of the tubing when sufficient shrinking is achieved.



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ALTERNATIVE REPAIR METHODS

No alternative repair methods are available for the SIR system wiring and components.

CONNECTOR POSITION ASSURANCE (CPA) RETAINER

The connector position assurance (CPA) retainer is a small plastic insert that is inserted through the locking tabs of all of the SIR system connectors. The purpose of the CPA retainer is to assure the connector halves are securely connected and they cannot vibrate apart. The CPA retainer must be in place to ensure good contact between the SIR mating terminals.

TERMINAL POSITION ASSURANCE (TPA) RETAINER

The terminal position assurance (TPA) retainer insert is similar to the plastic "combs" used in PCM connectors. The function of the TPA retainer is to keep the terminal securely seated in the connector body. The TPA retainer should be replaced on the connector body after service.

SIR SPECIAL TOOLS

SIR DRIVER/PASSENGER LOAD TOOL

The SIR driver/passenger load tool SA 9409Z is used as a diagnostic aid and safety device to prevent inadvertent inflator module deployment.

The load tool has three yellow connectors and one black connector attached to its case. The three small connectors are electrically functional and serve as resistive load substitutions. The large dummy connector does not serve as a load substitution but merely takes the physical place of the SDM connector when needed. Kit EV 9723Z contains the SDM connector. The kit also includes an instruction sheet on how to attach the connector to the load tool,

Two of the small connectors are used to substitute the load of the inflator modules. Another small connector is used to substitute the load of the SIR coil wire when it is connected on the right of the column to the vehicle harness. The large dummy connector separates the shorting bar in the SDM harness connector when it is connected to it in place of the SDM.

By substituting inflator module resistance using the load tool when called for, a determination can be made as to whether a component is causing system faults and which component is causing the fault. The load tool should be used only when specifically called for in the diagnostic procedures.

SATURN REPAIR KIT

Essential Tool Kit SA 9138Z contains special "Sealed Splices" for use in repairing SIR system wiring. A special crimping tool, heat torch and instruction manual for these splices are also included.

Two critical features of the sealed splices are special heat shrink sleeve with sealed splice and crosshatched (knurled) core crimp to provide necessary contact integrity for the sensitive, low energy circuits. The Saturn repair kit SA 9138Z also serves as a generic repair kit.

Terminals are not to be used to replace damaged SIR system terminals unless specifically indicated by the terminal package.

SPECIAL TOOLS DESCRIPTION

CAUTION: TO AVOID DEPLOYMENT WHEN TROUBLESHOOTING THE SIR SYSTEM, DO NOT USE ELECTRICAL TEST EQUIPMENT SUCH AS A BATTERY POWERED OR AC POWERED VOLTMETER, OHMMETER, ETC., OR ANY TYPE OF ELECTRICAL EQUIPMENT OTHER THAN THAT SPECIFIED IN THIS MANUAL. DO NOT USE A NON-POWERED PROBE TYPE TESTER. INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

The following numerical callouts refer to the tools illustrated on the facing page.

① SA 9138Z – Saturn Repair Kit

② SA 9207Z-A – Universal Deployment Harness

③ EV 9720Z – Driver Side Adapter – Available in 5-Pack Quantity

④ SA 9207Z-1 – Passenger Side Adapter

⑤ SA 9409Z – SIR Driver/Passenger Load Tool (SA 9409Z-B is the part number for the updated 1997 SIR Driver/Passenger Load Tool.)

⑥ EV 9723Z – 1997 SDM Connector (shown enlarged)

⑦ EV 9718Z – Digital Multimeter

⑧ SA 9206Z – Connector Test Adapter Kit

⑨ EV 9713Z – Junction Block Ground Strap

⑩ PDT (Portable Diagnostic Tool)

⑪ SA 9413NE – Passenger Side Deployment Fixture

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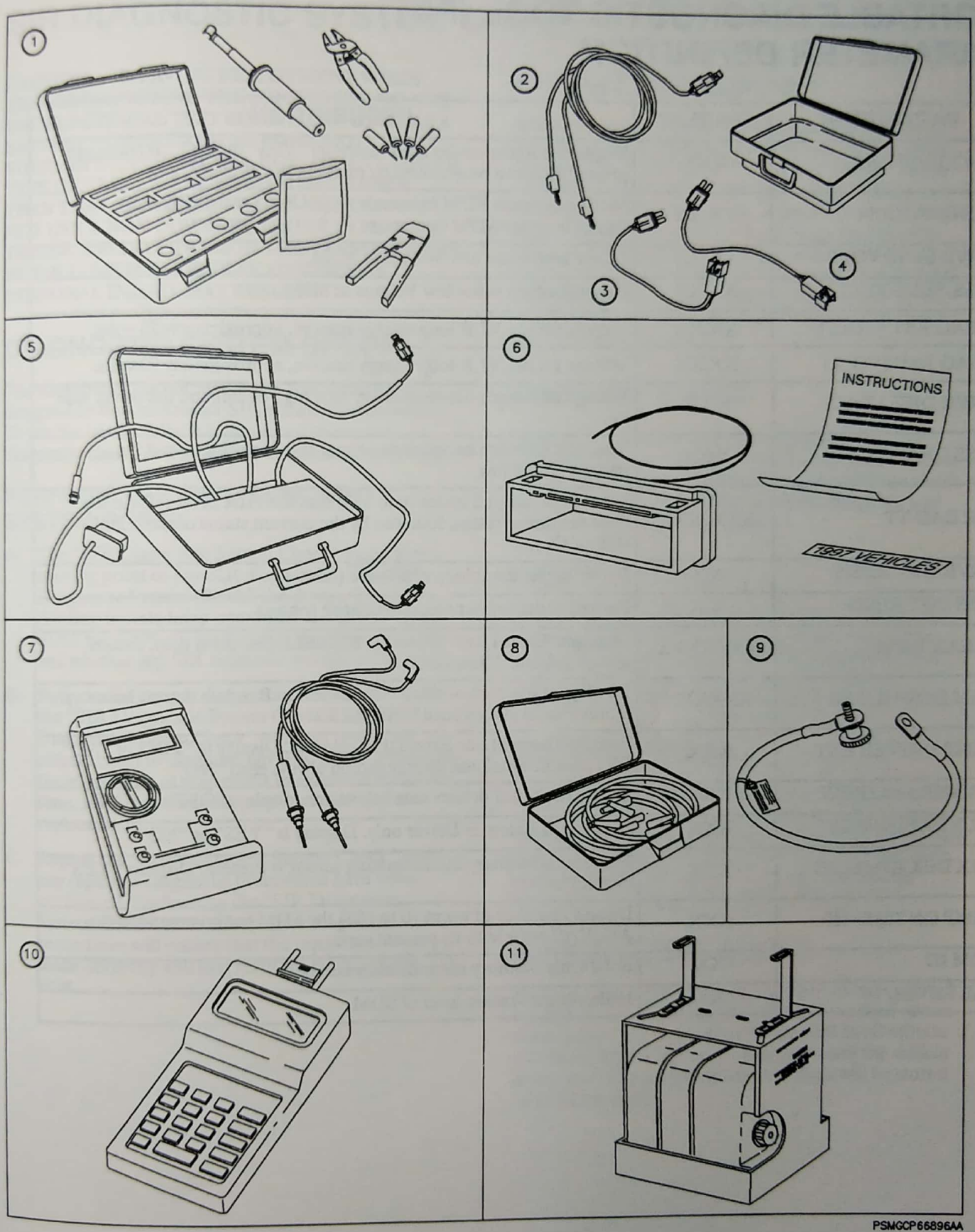

PSMGCP66896AA

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PORTABLE DIAGNOSTIC TOOL (PDT) PARAMETER DEFINITION

PARAMETER	DISPLAY	DESCRIPTION
T–CODE/FLAG	XXX	Displays if Active codes are present by "YES" or "NO". If codes are present they can be accessed by pressing the "FUNC" key.
RUN 1 VOLTS	XX.XX	Voltage between SDM terminals 10 (RUN 1) and 6 (Ground), 9 to 16 volts for SDM operation.
DRVR SENS VOLT	XX.XX	Driver loop sense low Voltage at SDM.
PASS SENS VOLT	XX.XX	Passenger loop sense low Voltage at SDM.
D BAG RSV (VOLT)	XX.XX	Voltage for the VLR loop energy reserve, approximately 23 volts.
P BAG RSV (VOLT)	XX.XX	Voltage for the VLR loop energy reserve, approximately 23 volts.
DRVR DIFF VOLT	X.XX	Voltage difference between driver side high circuit and the driver side low.
PASS DIFF VOLT	X.XX	Voltage difference between passenger side high circuit and the passenger side low.
AIR BAG TT	XXX XXX	Number of key pad cycles (0 to 125) that the AIR BAG telltale has been in current status, followed by the current status of the telltale (Off or On).
DRVR INIT RESIS	X.X	Driver deployment loop resistance (ohms).
PASS INIT RESIS	X.X	Passenger deployment loop resistance (ohms).
CLEAR DATA	XXXXXXX	Displays "Clear Data" **ENABLE/DISABLE** (for plant use), should always indicate "Disabled."
RAM DOWNLOAD	XXXXXX	Displays ability to download information to Random Access Memory. Status should always read "DISABLE"
LAMP DRIVER EXT	XXX	Indicates lamp driver External or Internal. Display is "YES" or "NO". EV1 uses Internal and display should always read "NO".
DRIVER SEATBELT	XXX	Current status of drivers seat belt switch, displays "OFF" or "ON".
DRIVER SIR ONLY	XXX	Indicates if system is Driver only. Display is "YES" or "NO".
AUX DISCRIM SENS	XXX	Indicates if auxiliary discriminating sensor is present. Displays "YES" or "NO".
LAMP ON TIME HR	XXX	Displays number of hours (0 to 182) the SDM has commanded the AIR BAG telltale to its present state.
ROM ID	XX	Read Only Memory identification number.
CAL LEVEL	XX	Indicates calibration level of SDM

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SIR DIAGNOSTIC SYSTEM CHECK

CAUTION: TO AVOID DEPLOYMENT WHEN TROUBLESHOOTING THE SIR SYSTEM, DO NOT USE ELECTRICAL TEST EQUIPMENT SUCH AS A BATTERY POWERED OR AC POWERED VOLTMETER, OHMMETER, ECT., OR ANY OTHER TYPE OF ELECTRICAL EQUIPMENT OTHER THAN THAT SPECIFIED IN THIS MANUAL. DO NOT USE A NON-POWERED PROBE TYPE TESTER. INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

DIAGNOSTIC SYSTEM CHECK

The diagnostic procedures used in this section are designed to find and repair SIR system malfunctions. To get the best results, it is important to use the diagnostic charts and follow the sequence listed below.

PERFORM THE SIR DIAGNOSTIC SYSTEM CHECK

A. The "SIR Diagnostic System Check" must be the starting point of any SIR diagnostics. The "SIR Diagnostic System Check" checks for the proper Air Bag telltale lamp operation, the ability of the SDM to communicate through the serial data line and whether any SIR diagnostic trouble codes exist.

B. Refer to the proper diagnostic chart as directed by the "SIR Diagnostic System Check." The "SIR Diagnostic System Check" will lead you to the correct chart to diagnose any SIR faults. **Bypassing these procedures may result in extended diagnostic time, incorrect diagnosis and incorrect parts replacement.**

C. Repeat the "SIR Diagnostic System Check" after any repair or diagnostic procedures have been performed. Performing the "SIR Diagnostic System Check" after all repair or diagnostic procedures will ensure that the repair has been made correctly and that no other malfunctions exist.

CIRCUIT DESCRIPTION

When the key pad is first placed in the "RUN" mode system voltage is supplied from the "RUN 1" positive temperature coefficient (PTC) to the "RUN 1" cavity "10" of the SDM. The SDM responds by flashing the AIR BAG telltale lamp seven times while performing tests on the SIR system. System voltage is applied to the AIR BAG telltale in the right telltale bank, from the "RUN 1" PTC to cavity "1" through the AIR BAG telltale cavity "3" and then to the SDM at the "WARN 1" cavity "7." This gives the SDM the ability to control the SIR warning lamp.

DIAGNOSTIC AIDS

NOTICE: The order in which diagnostic trouble codes (DTCs) are diagnosed is very important. Failure to diagnose the DTCs in the order specified may result in extended diagnostic time, incorrect diagnosis and unnecessary parts replacement.

ACTIVE CODES

Active diagnostic trouble codes (DTC) indicate faults that were present since the last key pad cycle. Active codes can be viewed on the Portable Diagnostic Tool (PDT) in the GENERAL INFORMATION or DIAGNOSTIC TROUBLE CODES table.

HISTORY CODES

History DTCs indicate faults that may not be currently detected, but have been present in past key pad cycles. History codes can be viewed on the Portable Diagnostic Tool (PDT) in the MALFUNCTION HISTORY table. History Code DTC 18, 24, 51, 53, or 71 cannot be cleared from MALFUNCTION HISTORY.

INTERMITTENT CODES

If a fault occurs intermittently, the first occurrence will result in a stored history DTC. If the same fault occurs twice within 125 key pad cycles, the AIR BAG telltale will be turned On and will remain On until the vehicle is serviced. The second occurrence fault will be stored as an active DTC.

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SIR DIAGNOSTIC SYSTEM CHECK

NOTE: AIR BAG telltale lamp as the key pad is placed in the RUN mode.

Does the AIR BAG telltale lamp flash seven times and then go out?

Yes

- Key pad in the LOCK mode.
- Connect PDT to data link connector.
- Key pad in the RUN mode.
- Request SIR diagnostic trouble code display.

Does PDT communicate with SDM?

No

Yes

Are DTCs displayed? (Record all codes on repair order active and history?

Yes

No

- If AIR BAG telltale lamp comes on steady, with no DTCs go to chart B.
- If AIR BAG telltale lamp does not come on steady and there are no DTCs, SIR system is functional no further diagnosis is required.

No

Does the AIR BAG telltale lamp flash seven times or more and come On steady?

Yes

No

Does the AIR BAG telltale lamp come On steady?

Yes

Go to chart B. Air Bag telltale lamp comes "ON" steady

No

Does the AIR BAG telltale lamp fail to come On?

Yes

Go to chart C. Air Bag telltale lamp does not come "ON"

No

Refer to intermittents in this manual

- Key pad in the LOCK mode.
- Connect PDT to data link connector.
- Key pad in the RUN mode.
- Request SIR diagnostic trouble code display.

Are diagnostic trouble codes displayed?

Yes

No

Refer to intermittents in this manual

There are DTCs that take priority over other DTCs, if there are multiple DTCs stored, diagnosis them in the following order

Active DTCs:

- 53
- 18 or 24
- 51
- 16 or 22
- 19 or 25
- 15 or 21
- 17 or 26
- 61
- 71

History DTCs:

- 53
- 18 or 24
- 51
- 71

NOTE: AIR BAG telltale lamp will remain On after the same active DTC appears twice and is stored in history. If the AIR BAG telltale lamp is On, the DTC could be an active DTC or a history DTC.

Request special test, all controllers.

Continues on next page

SIR DIAGNOSTIC SYSTEM CHECK

Continued from previous page

Does PDT communicate with HPVS/Thermal control module (HTCM)?

Yes

- Disconnect SDM harness connector.
- Place key pad in the RUN mode.
- With a DVM check voltage on cavity "5."

No

Go to BPM diagnostic trouble code 301 in the "Battery and Charging System Manual."

Is the voltage varying between 1.5 and 4.0 volts?

Yes

- Replace SDM. (Refer to "Sensing and Diagnostic Module" in this manual.)
- Repeat SIR Diagnostic System Check.

No

- Place key pad in the LOCK mode.
- Disconnect pink 24-way (J-2) connector from RH junction block.
- With SDM harness disconnected, check circuit 800 for continuity between RH junction block and SDM.

Is there coninuity on circuit 800 between SDM and RH junction block?

Yes

- Check terminal integrity at RH junction block. If ok, replace RH junction block.
- Repeat SIR Diagnostic System Check.

No

Repair open in circuit 800 and repeat SIR Diagnostic System.

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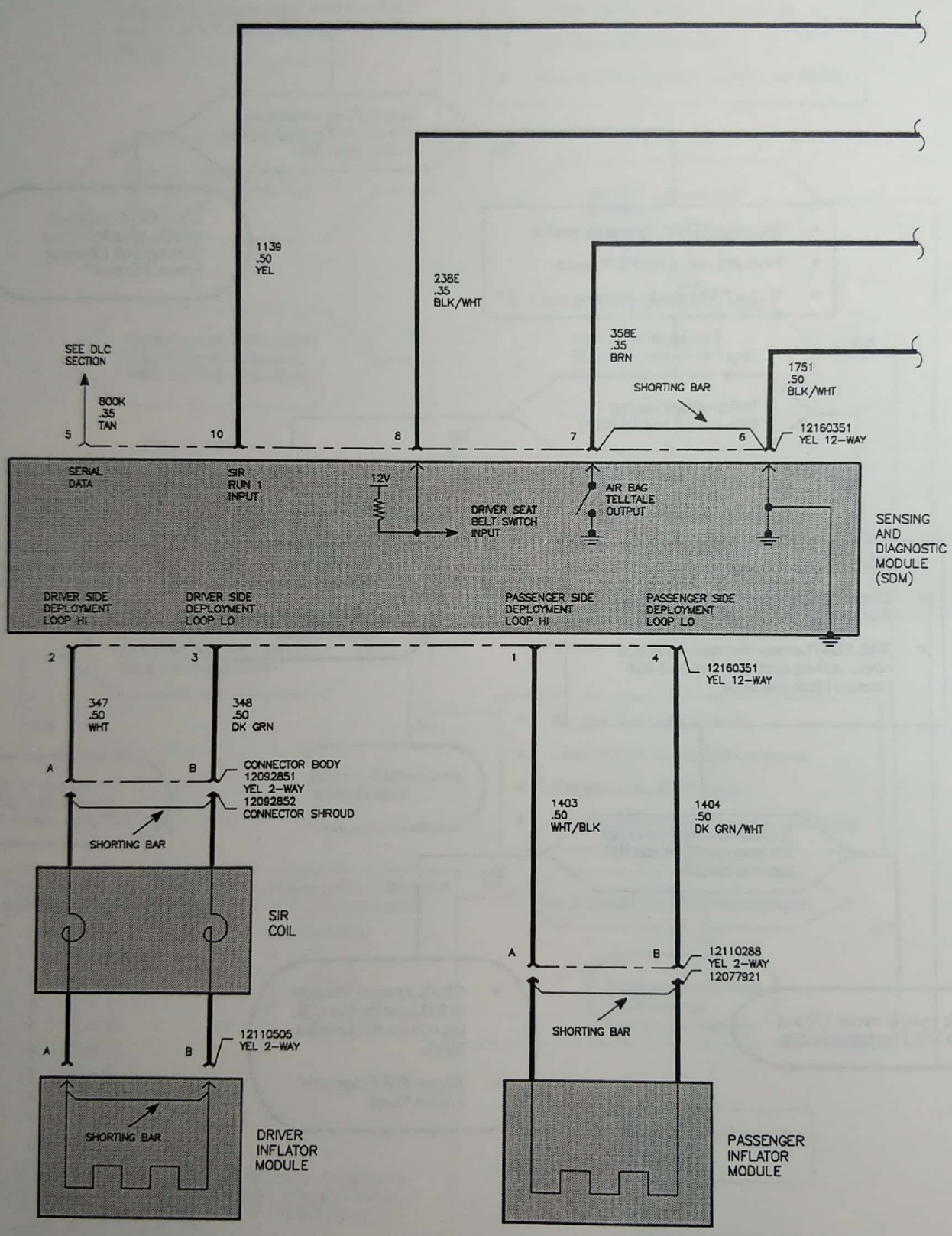
SUPPLEMENTAL INFLATABLE RESTRAINT SYSTEM SCHEMATIC



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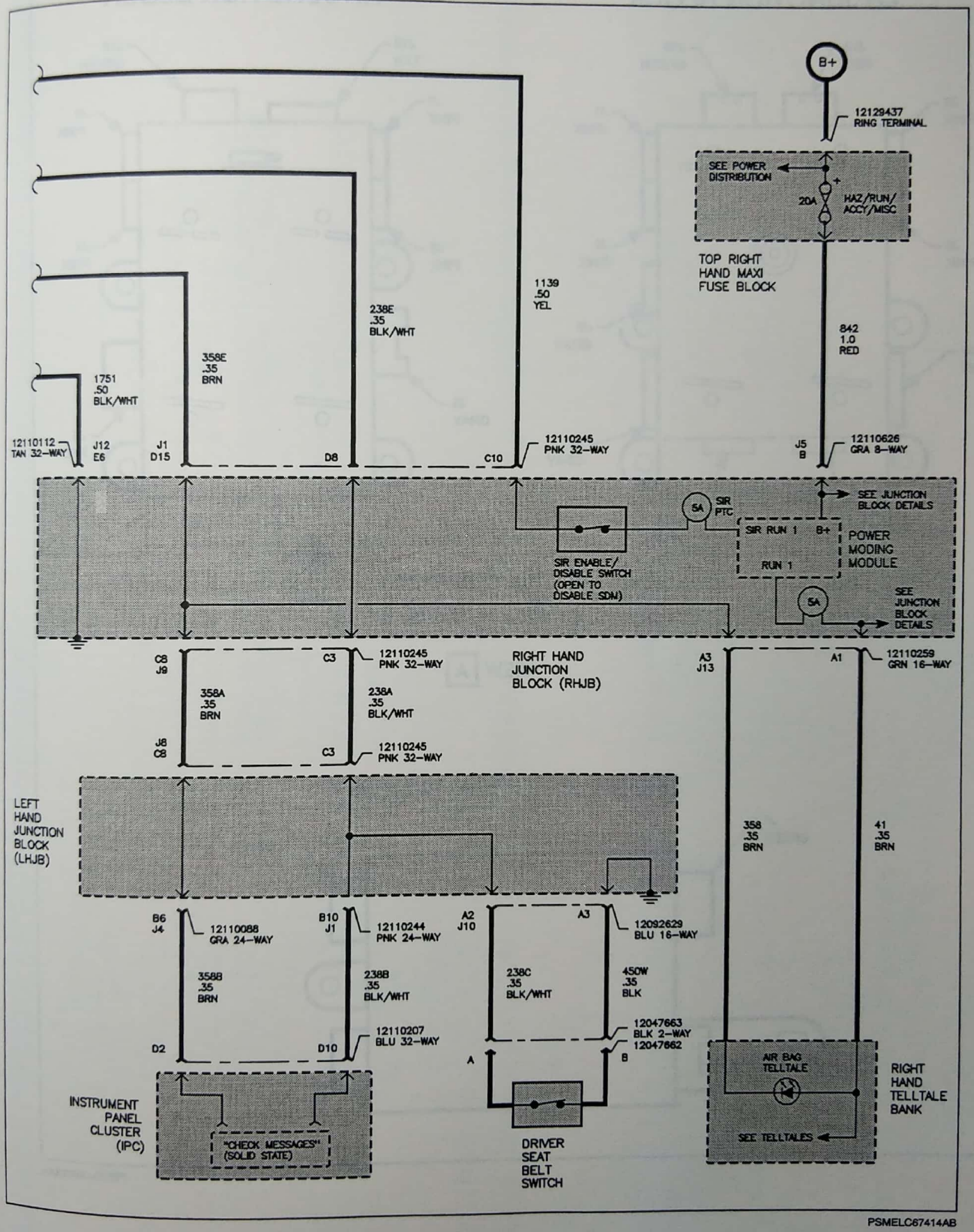

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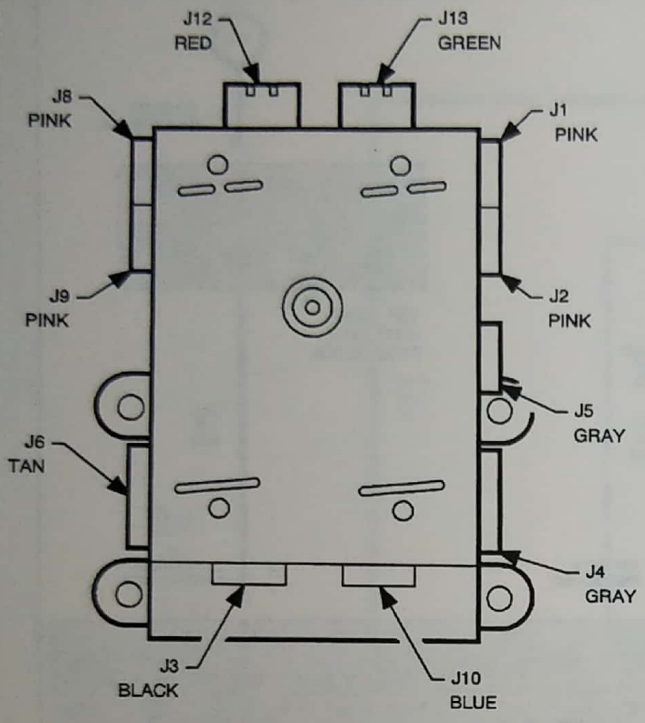
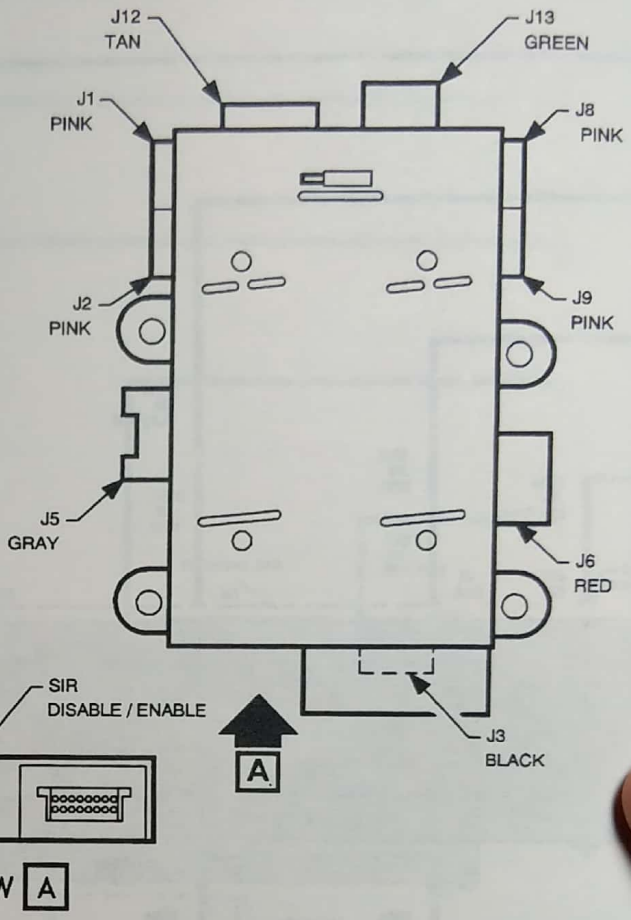
LH JUNCTION BLOCK

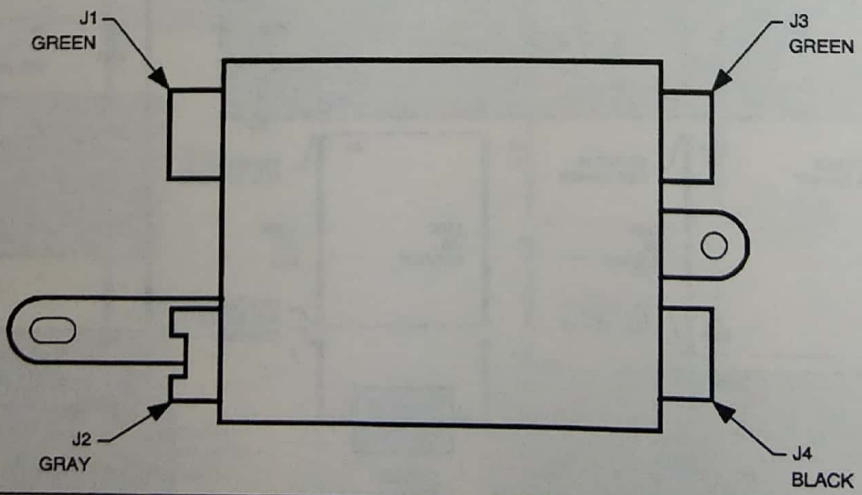


RH JUNCTION BLOCK



VIEW A

TRUNK JUNCTION BLOCK



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NOTES

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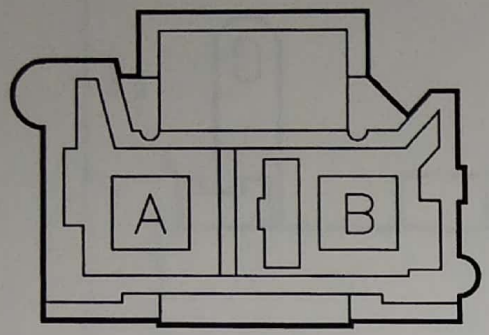
HARNESS CONNECTOR FACES

SIR DRIVER INFLATOR MODULE/IP-HARNESS CONNECTOR (DISABLE)



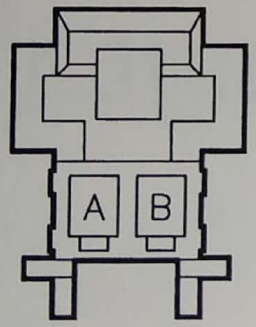
YELLOW
12110149

PSMELC66888AA

SIR DRIVER INFLATOR DISABLE/I/P HARNESS CONNECTOR (DISABLE) – 12110149				
CAVITY	WIRE COLOR	CIRCUIT NUMBER	WIRE SIZE	CIRCUIT FUNCTION
A	WHT	347	0.50	DRIVER LOOP HI
B	DK GRN	348	0.50	DRIVER LOOP LO

Location: I/P – Lower Left – Base of Steering Column

SIR DRIVER INFLATOR MODULE – COIL PIGTAIL



YELLOW
12110505

PSMELC66890AA

SIR DRIVER INFLATOR MODULE – COIL PIGTAIL – 12110505				
CAVITY	WIRE COLOR	CIRCUIT NUMBER	WIRE SIZE	CIRCUIT FUNCTION
A	WHT	347	0.50	DRIVER LOOP LO
B	DK GRN	348	0.50	DRIVER LOOP HI

Location: Behind Driver Inflator Module

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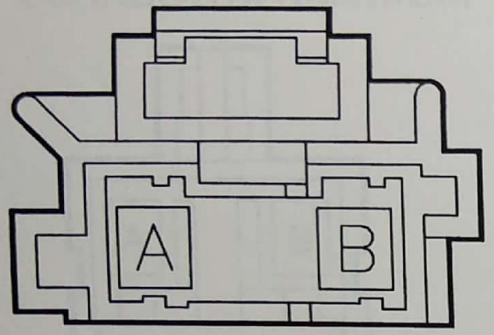
SIR INFLATOR DISABLE – COIL PIGTAIL



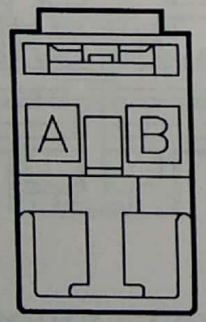
YELLOW
12092865

PSMELC66889AA

SIR INFLATOR DISABLE – COIL PIGTAIL – 12092865				
CAVITY	WIRE COLOR	CIRCUIT NUMBER	WIRE SIZE	CIRCUIT FUNCTION
A	WHT	347	0.50	DRIVER HI
B	DK GRN	348	0.50	DRIVER LO

Location: I/P – Lower Left – Base of Steering Column

SIR PASSENGER INFLATOR MODULE PIGTAIL



12077921

PSMELC66933AA

SIR PASSENGER INFLATOR MODULE PIGTAIL – 12077921				
CAVITY	WIRE COLOR	CIRCUIT NUMBER	WIRE SIZE	CIRCUIT FUNCTION
A	DK GRN/WHT	1403	0.50	PASSENGER HI
B	WHT/BLK	1404	0.50	PASSENGER LO

Location: Under – Right Side of I/P

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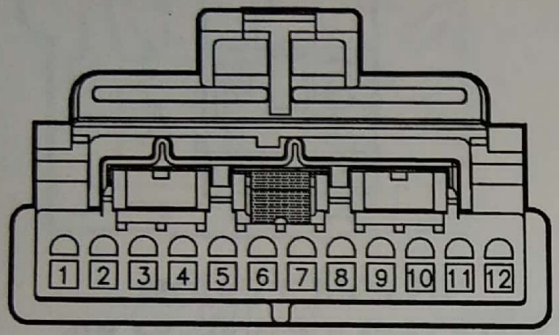
HARNESS CONNECTOR FACES

SENSING AND DIAGNOSTIC MODULE (SDM)



12160351
YELLOW

PSMELC66892AA

SENSING AND DIAGNOSTIC MODULE – 12160351				
CAVITY	WIRE COLOR	CIRCUIT NUMBER	WIRE SIZE	CIRCUIT FUNCTION
1	WHT/BLK	1403	0.50	PASSENGER HI
2	WHT	347	0.50	DRIVER HI
3	DK GRN	348	0.50	DRIVER LO
4	DK GRN/WHT	1404	0.50	PASSENGER LO
5	TAN	800K	0.35	SERIAL DATA
6	BLK/WHT	1751B	0.50	GROUND
7	BRN	358E	0.35	AIR BAG IND OUT
8	BLK/WHT	238E	0.35	DRIVER SEAT BELT IN
9				
10	YEL	1139	0.35	RUN 1
11				
12				

Location: RH Side of Battery Tunnel Under carpet.

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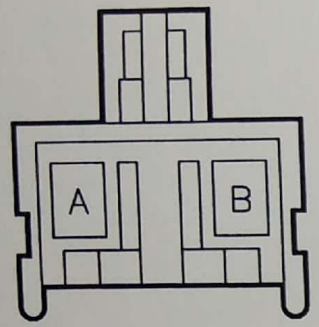
SIR PASSENGER INFLATOR MODULE/IP – HARNESS CONNECTOR (DISABLE)



YELLOW
12110288

PSMELC66887AA

SIR PASSENGER INFLATOR MODULE/I/P HARNESS CONNECTOR (DISABLE) – 12110288				
CAVITY	WIRE COLOR	CIRCUIT NUMBER	WIRE SIZE	CIRCUIT FUNCTION
A	WHT/BLK	1403	0.50	PASSENGER HI
B	DK GRN	1404	0.50	PASSENGER LO

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NOTES

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CHARTS A – D

CHART A – SDM INTEGRITY CHECK

CHART B – AIR BAG TELLTALE LAMP COMES "ON" STEADY

CHART C – AIR BAG TELLTALE LAMP DOES NOT COME "ON"

CHART D – SDM CANNOT COMMUNICATE WITH PDT

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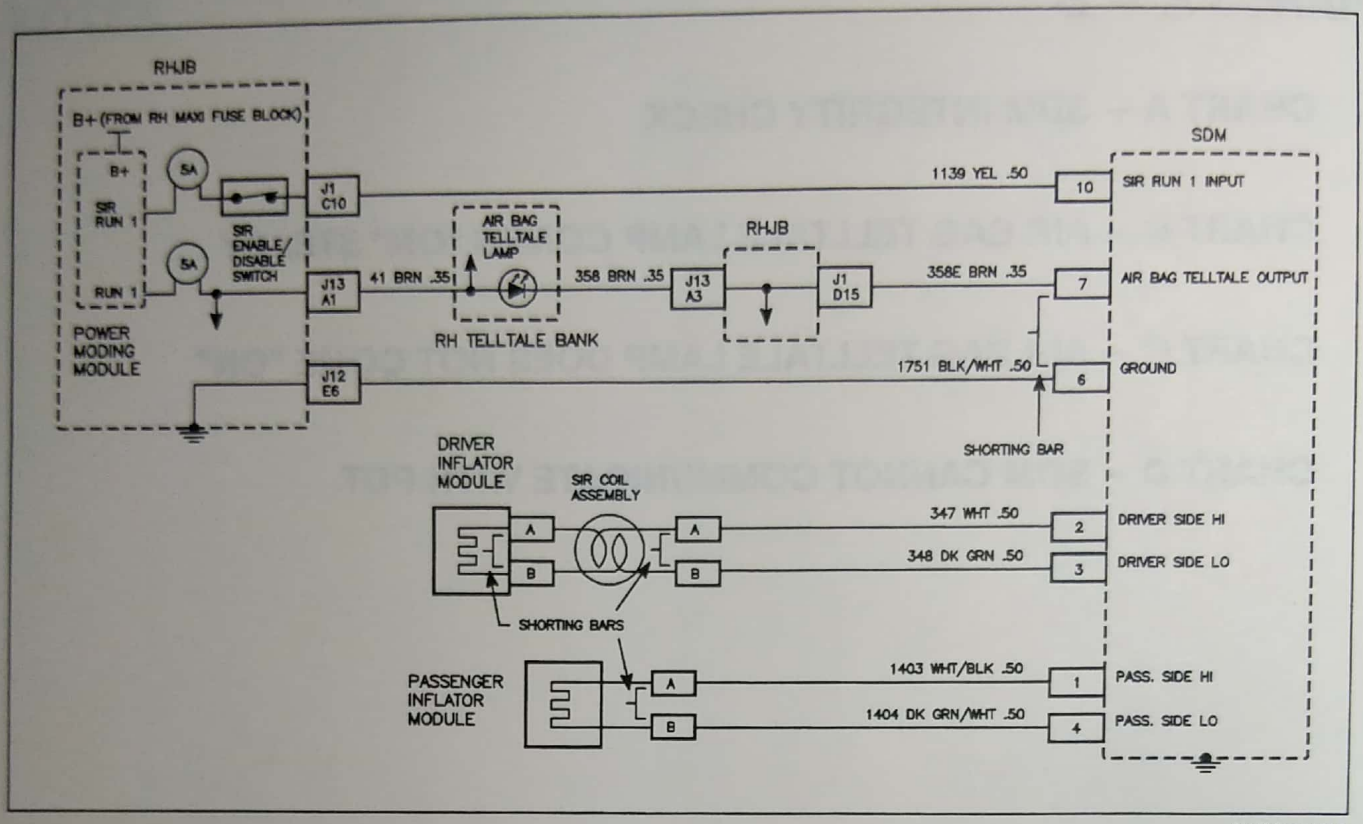

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CHART A

SDM INTEGRITY CHECK

CIRCUIT DESCRIPTION

When the SDM recognizes "RUN 1" voltage applied to cavity "10" is greater than approximately 9 volts, the AIR BAG telltale lamp is flashed seven times to verify operation. During this time the SDM performs "turn-on" tests (including current source diagnostics) followed by "continuous monitoring" tests. When a malfunction is detected the SDM sets an active diagnostic trouble code and illuminates the AIR BAG telltale lamp. At power-up with an active DTC code, the AIR BAG telltale lamp will flash seven times and then remain on steady. The SDM will clear active diagnostic trouble codes and move them to a history file when a malfunction is no longer detected and/or the key pad is cycled, except for DTC 18, 24, 51, 53 and 71. If DTC 18, 24, 51, 53 or 71 are set, the SDM must be replaced.

CAUTION: DURING SERVICE PROCEDURES, BE VERY CAREFUL WHEN HANDLING A SENSING AND DIAGNOSTIC MODULE (SDM). NEVER STRIKE OR JAR THE SDM. NEVER POWER UP THE SIR SYSTEM WHEN THE SDM IS NOT RIGIDLY ATTACHED TO THE VEHICLE. ALL SDM AND MOUNTING BRACKET FASTENERS MUST BE CAREFULLY TORQUED AND THE ARROW MUST BE POINTING TOWARD THE FRONT OF THE VEHICLE TO ENSURE PROPER OPERATION OF THE SIR SYSTEM. THE SDM COULD BE ACTIVATED WHEN POWERED WHILE NOT RIGIDLY ATTACHED TO THE VEHICLE WHICH COULD CAUSE DEPLOYMENT AND RESULT IN PERSONAL INJURY.

This chart assumes that the "SIR Diagnostic System Check" and either a symptom chart or a diagnostic trouble code chart diagnosis have been performed. When all circuitry outside the SDM has been found to operate properly, as indicated by the appropriate diagnostic chart, and the symptom or DTC remains current, the following diagnostic procedures must be performed to verify the need for SDM replacement.

CHART A
SDM INTEGRITY CHECK

- Key pad in the LOCK mode.
- Reconnect all SIR components ensure all components are properly mounted.
- Ensure the key pad has been placed in the LOCK mode for more than thirty seconds.
- Note AIR BAG telltale lamp as the key pad is placed in the RUN mode.

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

Does AIR BAG warning lamp flash seven times and go Off?

Yes

- The symptom or DTC is no longer occurring.
- Clear SIR diagnostic trouble codes.
- Repeat SIR diagnostic system check.

No

Using a PDT request diagnostic trouble code (DTC) display.

Is the same symptom or code occurring as when the SIR diagnostic system check was first performed?

No

Go to the appropriate chart for the indicated malfunction.

Yes

- Clear SIR diagnostic trouble codes.
- Key pad in the LOCK mode for at least thirty seconds.
- Note AIR BAG telltale lamp as the key pad is placed in the RUN mode.

Does AIR BAG warning lamp flash seven times and go Off?

No

- Key pad in the LOCK mode.
- Replace the SDM.
- Refer to "Sensing and Diagnostic Module" in this manual.
- Reconnect all SIR system components. Ensure all components are properly mounted.
- Repeat SIR diagnostic system check.

Yes

SIR system is functional, no further diagnosis is required.

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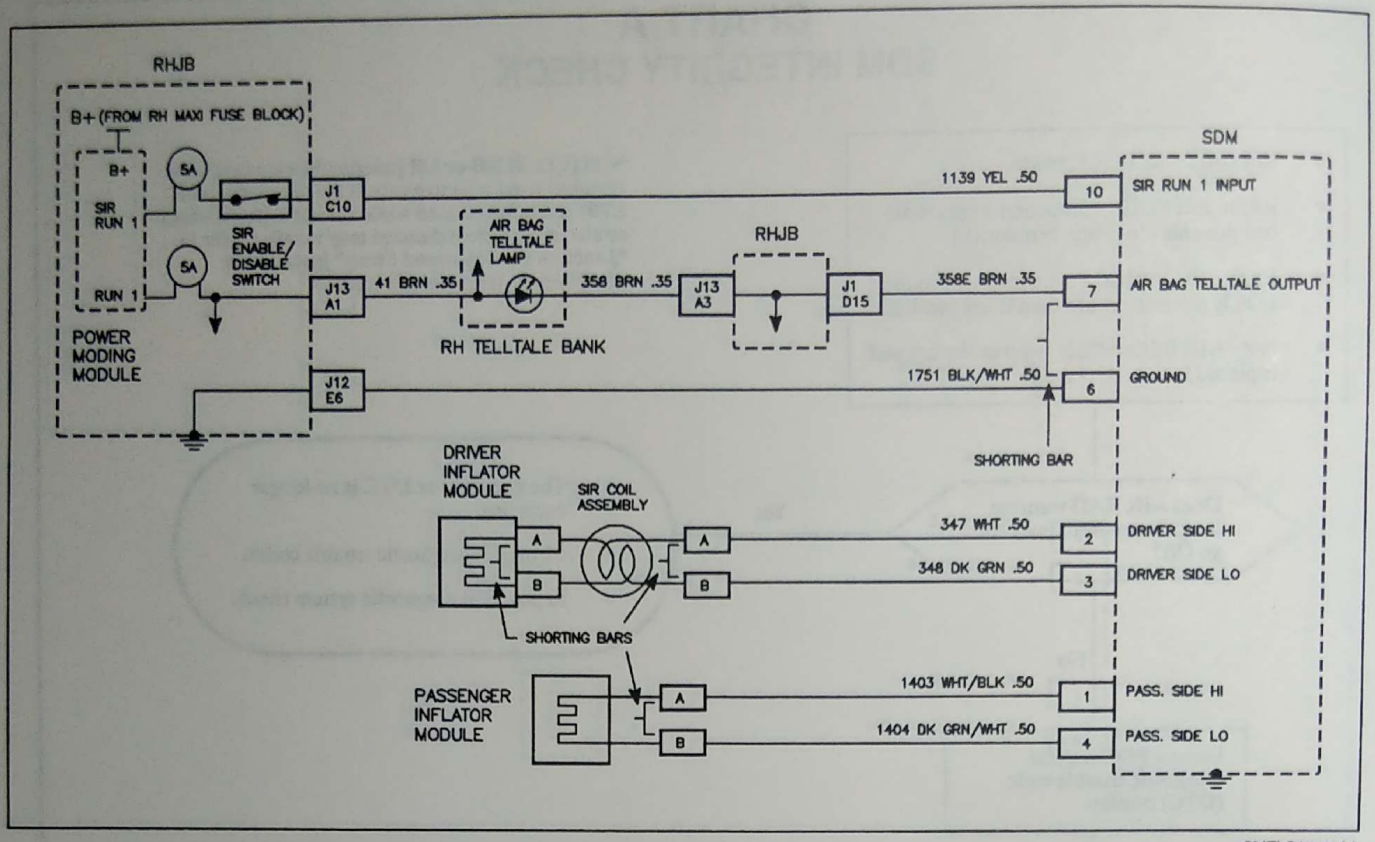

SMELC67415AA

CHART B

AIR BAG WARNING LAMP COMES "ON" STEADY

CIRCUIT DESCRIPTION

When the key pad is first placed in the "RUN" mode, "RUN 1" voltage is applied to the AIR BAG telltale lamp which is connected to the "AIR BAG" telltale output cavity "7" of the SDM. The AIR BAG positive temperature coefficient (PTC) applies system voltage to the "RUN 1" input "10" of the SDM. The SDM responds by flashing the AIR BAG telltale lamp seven times by providing a ground. If "RUN 1" is outside the normal operating voltage range, approximately 9 VDC to 16 VDC, the AIR BAG telltale lamp will come On solid with no diagnostic trouble codes set.

DIAGNOSTIC AIDS

A shorting bar in the harness connector at the SDM ensures that the AIR BAG telltale lamp will come On steady if the connector is not fully seated.

If the SDM harness connector, strain relief or the CPA is installed incorrectly or not installed, the "AIR BAG" telltale lamp will be On steady.

When measurements are requested in this chart use SA 91114NE DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittence and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

NOTICE: Perform "SIR DIAGNOSTIC SYSTEM CHECK" before proceeding with this chart.

CHART B
AIR BAG TELLTALE LAMP COMES "ON" STEADY

- Key pad in the LOCK mode.
- Inspect SIR ENABLE/DISABLE switch located in the RH junction block..

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

Is the switch in the DISABLE position?

Yes → Place switch in the ENABLE position.

No

Inspect SDM harness connector and CPA for proper connection.

Is CPA and connector properly seated?

No → Disconnect and reconnect SDM connector to insure proper connection.

Yes

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at the base of steering column and under the RH side of I/P.
- Disconnect SDM harness connector.
- Key pad in the RUN mode.
- With a DVM measure the voltage between cavity "10" and a known good ground.

Is voltage between 10.5 and 14.5 volts?

No →

- Key pad in the LOCK mode.
- Remove RH junction block from front of dash and install ground strap, service tool SA-92027.
- Remove RH FLIP (pink) harness connector.
- Key pad in the RUN mode.
- Check voltage between pin "C10" or RH junction block and a known good ground.

Is voltage between 10.5 and 14.5 volts?

Yes →

No →

Yes

- Key pad in the LOCK mode.
- With a DVM check continuity between circuit 1751 cavity "6" of SDM and ground.

Is there continuity on circuit 1751 (low resistance)?

Yes →

No →

Continued on next page.

CHART B
AIR BAG TELLTALE LAMP COMES "ON" STEADY (CONT.)

Continued from previous page.

Yes

- Replace the SDM. (Refer to "Sensing and Diagnostic Module" in this manual.)
- Reconnect all SIR system components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat SIR diagnostic system check.

No

- Check terminal integrity at SDM terminal "6" and RH junction block terminal "C6" if ok, repair open in circuit 1751 between SDM terminal "6" and RH junction block.
- Reconnect all SIR system components. Ensure all components are properly mounted.
- Repeat SIR diagnostic system check.

Yes

- Repair open or short on circuit 1139 between RH junction block and SDM.
- Reconnect all SIR system components. Ensure all components are properly mounted.
- Repeat SIR diagnostic system check.

No

- Replace RH junction block.
- Reconnect all SIR system components. Ensure all components are properly mounted.
- Repeat SIR diagnostic system check.

NOTICE: If either the RH or LH junction block must be removed from mounting studs for diagnosis, tool EV9713Z must be installed and maintained when vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this manual.)

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NOTES

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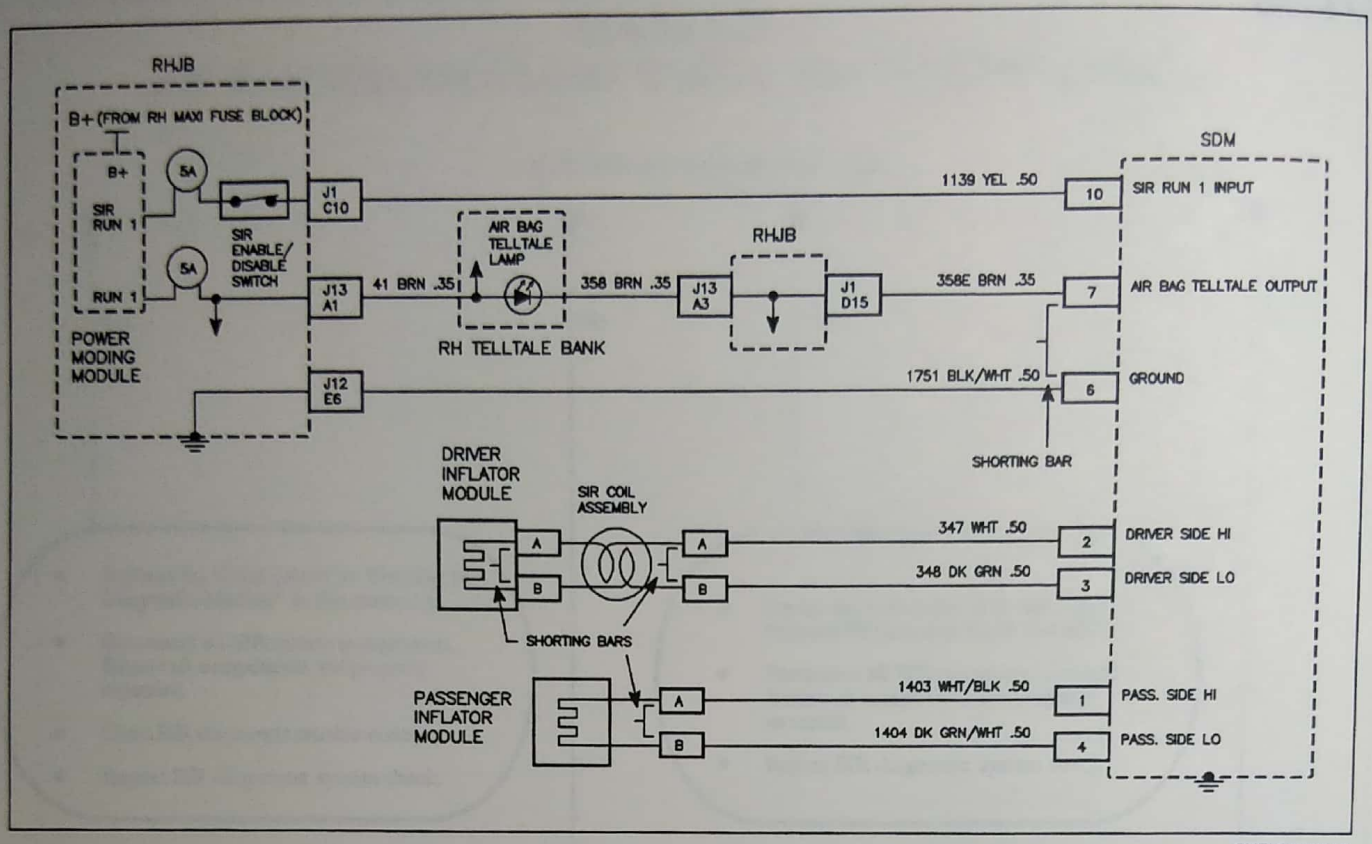

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CHART C

AIR BAG TELLTALE LAMP DOES NOT COME "ON"

CIRCUIT DESCRIPTION

When the key pad is first placed in the RUN mode "RUN 1" voltage is applied to the AIR BAG telltale lamp which is connected to the "AIR BAG" cavity "7" of the SDM. The AIR BAG positive temperature coefficient (PTC) applies system voltage to the "RUN 1" input cavity "10" of the SDM. The SDM responds by flashing the AIR BAG telltale lamp seven times by providing a ground. If "RUN 1" is outside the normal operating voltage range, approximately 9 VDC to 16 VDC, the AIR BAG telltale lamp will come On solid with no diagnostic trouble codes set.

When measurements are requested in this chart use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittence and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

NOTICE: Perform "SIR DIAGNOSTIC SYSTEM CHECK" before proceeding with this chart.

CHART C
AIR BAG TELLTALE LAMP DOES NOT COME ON

Note the RH telltale bank as key pad is placed in the RUN mode.

Does the SERVICE SOON indicator come on and go off after the key pad is placed in the RUN mode.

No

- Key pad in the LOCK mode.
- Remove RH junction block and disconnect RH tell tale bank (green connector 16–way [J13]) from RH junction block. Place the key pad in the RUN mode. With a DVM check for Run 1 voltage on RH junction block side, pin "A1."

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

Is voltage between 10.5 and 14.5 volts?

Yes

Replace RH telltale bank. Refer to telltale replacement in this section

No

If the vehicle goes in the Run mode and there are no other symptoms replace the RH junction block.

Yes

- Key pad in the LOCK mode.
- Disconnect the SDM connector.
- Key pad in the RUN mode.

Does the AIR BAG tell tale come on steady?

No

- Key pad in the LOCK mode.
- Remove RH junction block install test tool EV9713Z between junction box and ground.
- Install a test probe on "circuit 358" brown wire in cavity "A2" of junction block.
- Place the key pad in the RUN mode. With a DVM check voltage between the test probe and ground.

Yes

- Check harness connection at SDM module. If ok replace SDM module.
- Reconnect all SIR system components ensure all components are properly mounted
- Repeat SIR diagnostic system check.

Is voltage between 10.5 and 14.5 volts?

No

Replace RH telltale bank and repeat diagnostic performance check.

Yes

- Key pad in the LOCK mode.
- Reconnect telltale connector to RH junction block.

- Disconnect RH flip harness connector from junction block (pink connector 32-way) (J1).
- Place the key pad in the RUN mode, using a DVM check voltage on pin "D15" of the RH junction block and ground.

Is the voltage above 10.5 volts?

Yes

- Repair open in circuit 358.
- Reconnect all SIR system components. Ensure all components are properly mounted.
- Repeat SIR diagnostic system check.

No

- Check all connections if ok replace the RH junction block.
- Reconnect all SIR system components. Ensure all components are properly mounted.
- Repeat SIR diagnostic system check.

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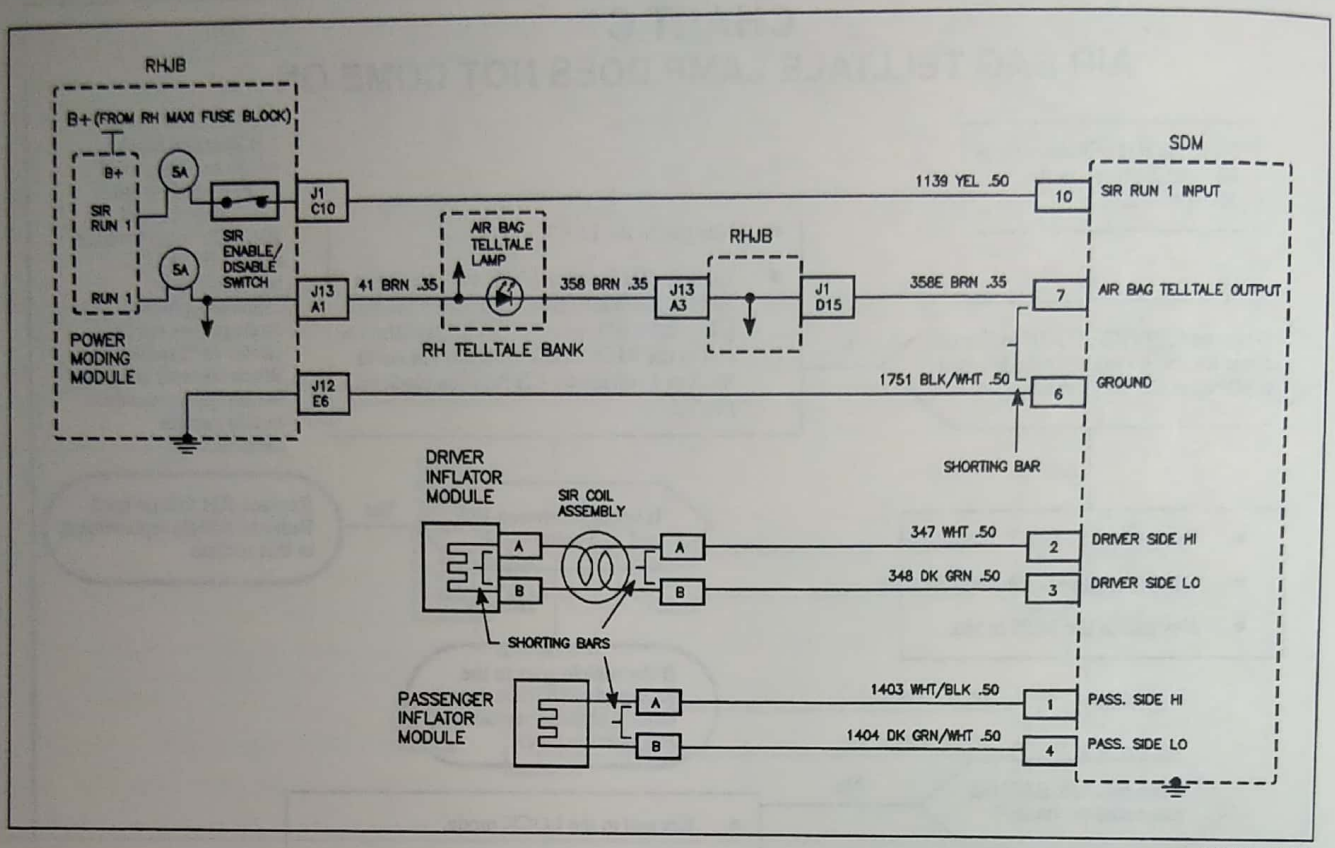

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CHART D

SDM CANNOT COMMUNICATE WITH PDT

CIRCUIT DESCRIPTION

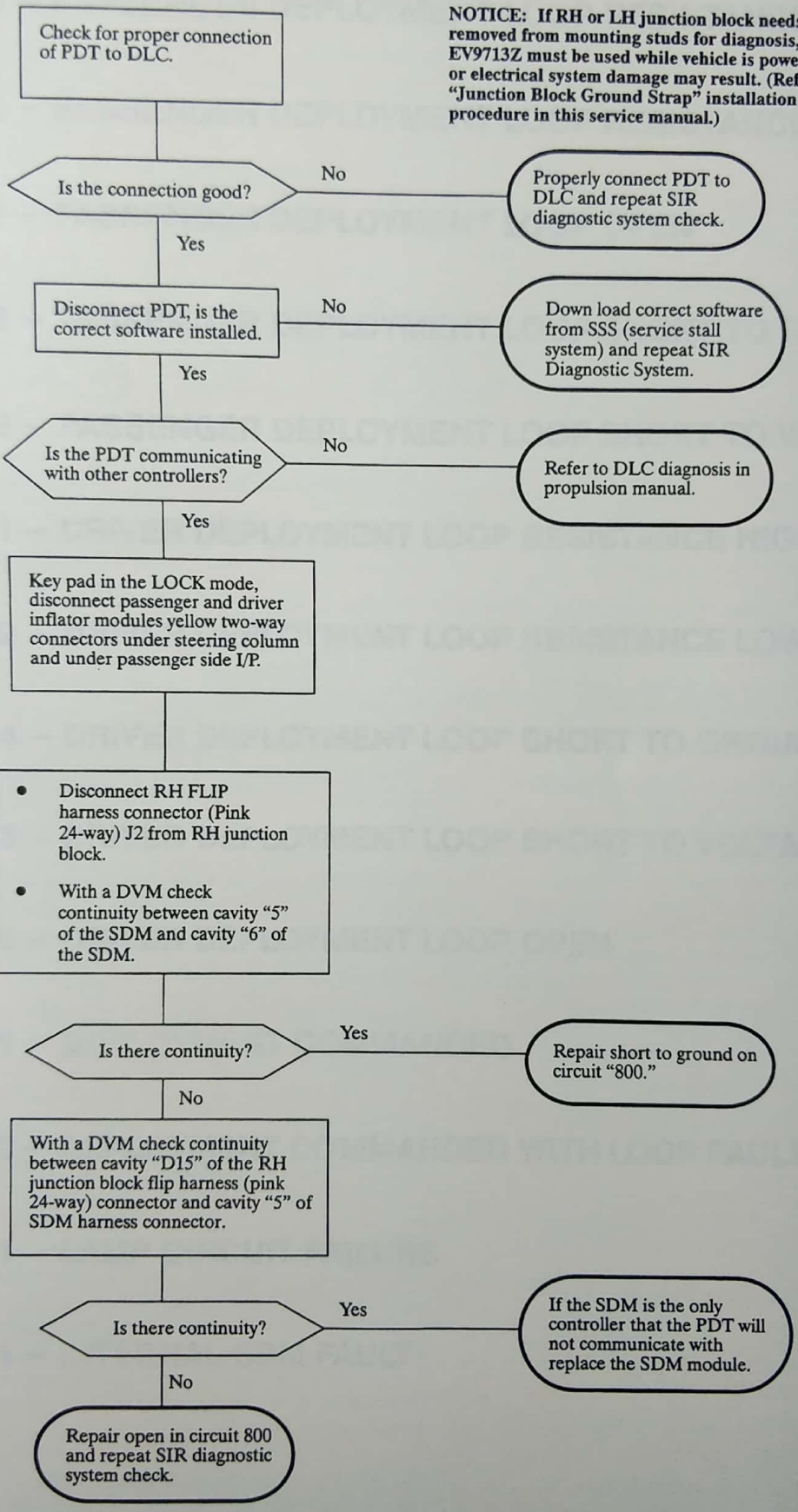
When the key pad is first place in the RUN mode "RUN 1" voltage is applied to the AIR BAG telltale lamp which is connected to the "AIR BAG" telltale output cavity "7" of the SDM. The AIR BAG positive temperature coefficient (PTC) applies system voltage to the "RUN 1" input cavity "10" of the SDM. The SDM responds by flashing the AIR BAG telltale lamp seven times by providing a ground. If "RUN 1" is outside of normal operating voltage range, approximately 9 VDC to 16 VDC, the AIR BAG telltale lamp will come On solid with no diagnostic trouble codes set.

When measurements are requested in this chart, use SA 91114NE DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested, refer to "Intermittence and Poor Connections" in this manual. When a wire connector or terminal repair is requested, use the proper repair parts and refer to "Wiring Repair" in this manual.

NOTICE: Perform "SIR DIAGNOSTIC SYSTEM CHECK" before proceeding with this chart.

CHART D
SDM CANNOT COMMUNICATE WITH THE PDT

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)


Check for proper connection of PDT to DLC.
Is the connection good?
No
Properly connect PDT to DLC and repeat SIR diagnostic system check.
Yes
Disconnect PDT, is the correct software installed.
No
Down load correct software from SSS (service stall system) and repeat SIR Diagnostic System.
Yes
Is the PDT communicating with other controllers?
No
Refer to DLC diagnosis in propulsion manual.
Yes
Key pad in the LOCK mode, disconnect passenger and driver inflator modules yellow two-way connectors under steering column and under passenger side I/P.
• Disconnect RH FLIP harness connector (Pink 24-way) J2 from RH junction block.
• With a DVM check continuity between cavity "5" of the SDM and cavity "6" of the SDM.
Is there continuity?
Yes
Repair short to ground on circuit "800."
No
With a DVM check continuity between cavity "D15" of the RH junction block flip harness (pink 24-way) connector and cavity "5" of SDM harness connector.
Is there continuity?
Yes
If the SDM is the only controller that the PDT will not communicate with replace the SDM module.
No
Repair open in circuit 800 and repeat SIR diagnostic system check.

NOTES

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DIAGNOSTIC TROUBLE CODES

DTC 15 – PASSENGER DEPLOYMENT LOOP RESISTANCE HIGH

DTC 16 – PASSENGER DEPLOYMENT LOOP RESISTANCE LOW

DTC 17 – PASSENGER DEPLOYMENT LOOP OPEN

DTC 18 – PASSENGER DEPLOYMENT LOOP SHORT TO GROUND

DTC 19 – PASSENGER DEPLOYMENT LOOP SHORT TO VOLTAGE

DTC 21 – DRIVER DEPLOYMENT LOOP RESISTANCE HIGH

DTC 22 – DRIVER DEPLOYMENT LOOP RESISTANCE LOW

DTC 24 – DRIVER DEPLOYMENT LOOP SHORT TO GROUND

DTC 25 – DRIVER DEPLOYMENT LOOP SHORT TO VOLTAGE

DTC 26 – DRIVER DEPLOYMENT LOOP OPEN

DTC 51 – DEPLOYMENT COMMANDED

DTC 53 – DEPLOYMENT COMMANDED WITH LOOP FAULTS PRESENT

DTC 61 – LAMP CIRCUIT FAILURE

DTC 71 – INTERNAL SDM FAULT

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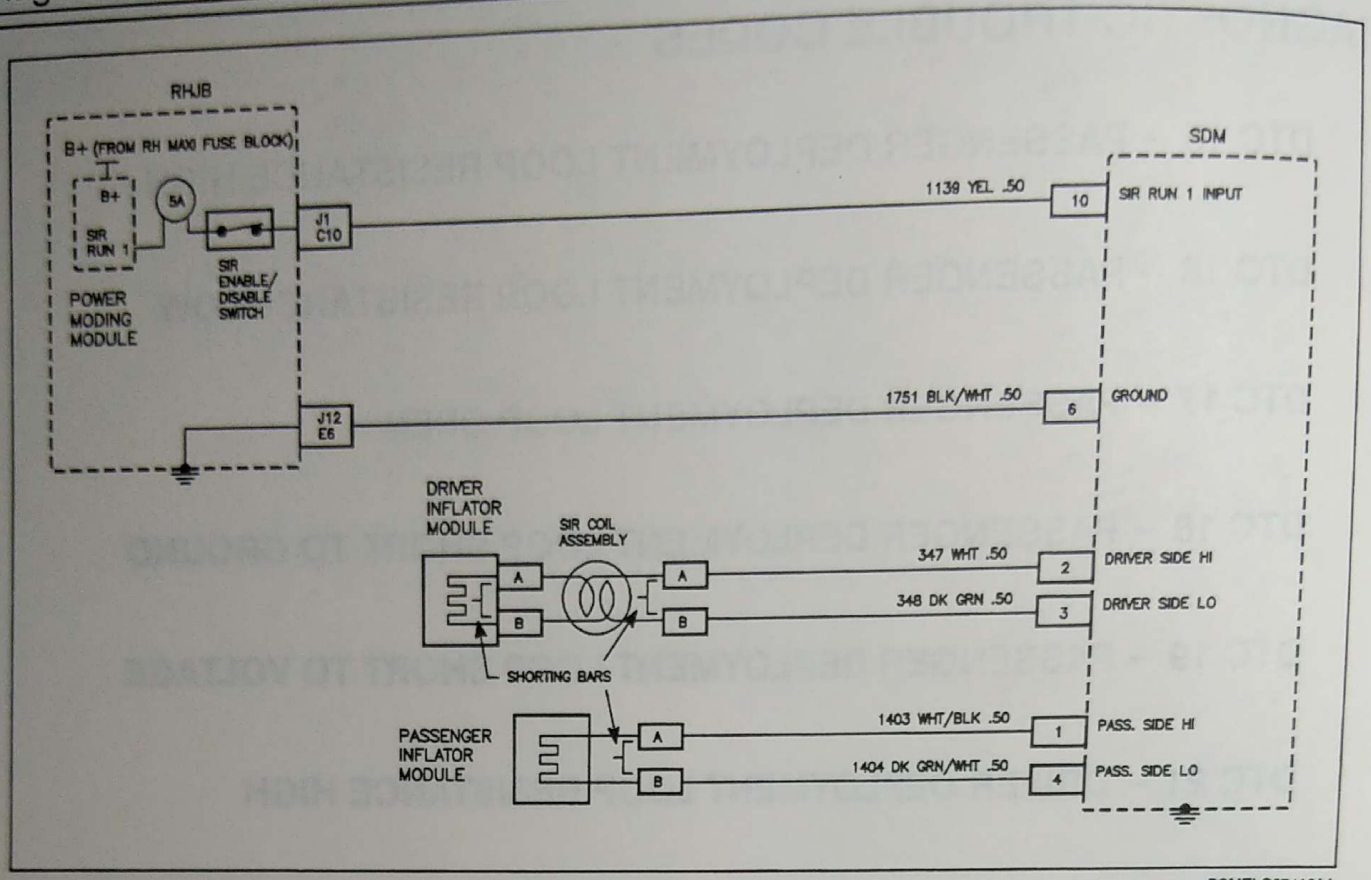

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DTC 15

PASSENGER DEPLOYMENT LOOP RESISTANCE HIGH

CIRCUIT DESCRIPTION

When the key pad is placed in the RUN mode the SDM will perform tests to diagnose critical malfunctions within itself. Upon passing these tests "RUN 1," VLR and deployment loop voltages are measured to ensure they are within their respective normal voltage ranges. The SDM then proceeds with the "Current Source Diagnostics." "Passenger Side LO" cavity "4" is grounded through a resistor and the passenger current source connected to "Passenger Side HI" cavity "1" allows a known amount of current to flow. By monitoring the voltage difference between "Passenger Side HI" and "Passenger Side LO" the SDM calculates the combined resistance of the passenger inflator module, harness wiring Circuits 1403 and 1404 and connector terminal contact.

DTC WILL SET WHEN:

The combined resistance of the passenger inflator module, harness wiring circuits 1403 and 1404, and connector terminal contact is greater than 3.6 ohms. This test is run once each RUN cycle during the "Current Source Diagnostics" when:

1. No "higher priority faults" are detected during "Turn-On."
2. No "higher priority faults" are detected during "Continuous Monitoring."
3. "RUN 1" voltage is above a specified value.

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 15.

DTC WILL CLEAR WHEN:

The malfunction is no longer occurring and the key pad is in the LOCK mode, or a PDT "Clear Codes" command is issued.

DIAGNOSTIC AIDS:

An intermittent condition is likely to be caused by a poor connection at the passenger inflator module harness connector cavities A or B, SDM cavities "1" or "4," or a poor wire to terminal connection to circuits 1403 or 1404. The test for this diagnostic trouble code is only run while the AIR BAG telltale lamp is performing the bulb check, unless DTC 17 or 26 is detected. When a PDT "Clear Codes" command is issued and the malfunction is still present the DTC will not reappear until the next RUN cycle.
When measurements are requested in this chart use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittence and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

DTC 15
PASSENGER DEPLOYMENT LOOP RESISTANCE HIGH

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
- Check for proper connection to passenger inflator module at cavities "A" and "B."

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

Is there a good connection at passenger inflator module?

No

- Repair faulty connection using the repair procedures in this manual.
- Reconnect all SIR components and ensure all components are properly mounted.
- Repeat diagnostic system check.

Yes

- Connect SA9409Z-A SIR driver/passenger load tool to driver and passenger inflator modules harness connectors.
- Key pad in the RUN mode.

Is DTC 15 still current?

No

- Key pad in the LOCK mode.
- Replace passenger inflator module.
- Reconnect all SIR components and ensure all components are properly mounted.
- Repeat diagnostic system check.

Yes

- Key pad in the LOCK mode.
- Disconnect driver/passenger load tool.
- Disconnect SDM.
- Check for proper connection to SDM at cavities "1" and "4."

Is there a good connection at passenger inflator module?

No

- Repair faulty connection using the repair procedures in this manual.
- Reconnect all SIR components and ensure all components are properly mounted.
- Repeat diagnostic system check.

Yes

- Measure resistance from SDM harness connector cavity "1" to passenger inflator harness connector "A" (harness side).

Is there continuity (low resistance)?

No

- Repair open or high resistance in circuit 1403.
- Reconnect all SIR system components and ensure all components are properly mounted.
- Repeat SIR diagnostic system check.

Yes

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DTC 15
PASSENGER DEPLOYMENT LOOP RESISTANCE HIGH (CONT.)

Continued from previous page.

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

- Measure resistance from SDM harness connector cavity "4" to passenger inflator harness connector "B" (harness side).

Is there continuity (low resistance)?

No

- Repair open or high resistance in circuit 1403.
- Reconnect all SIR system components.
- Reconnect all SIR system components and ensure all components are properly mounted.
- Repeat SIR diagnostic system check.

Yes

- Refer to Chart A "SDM integrity check."

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NOTES

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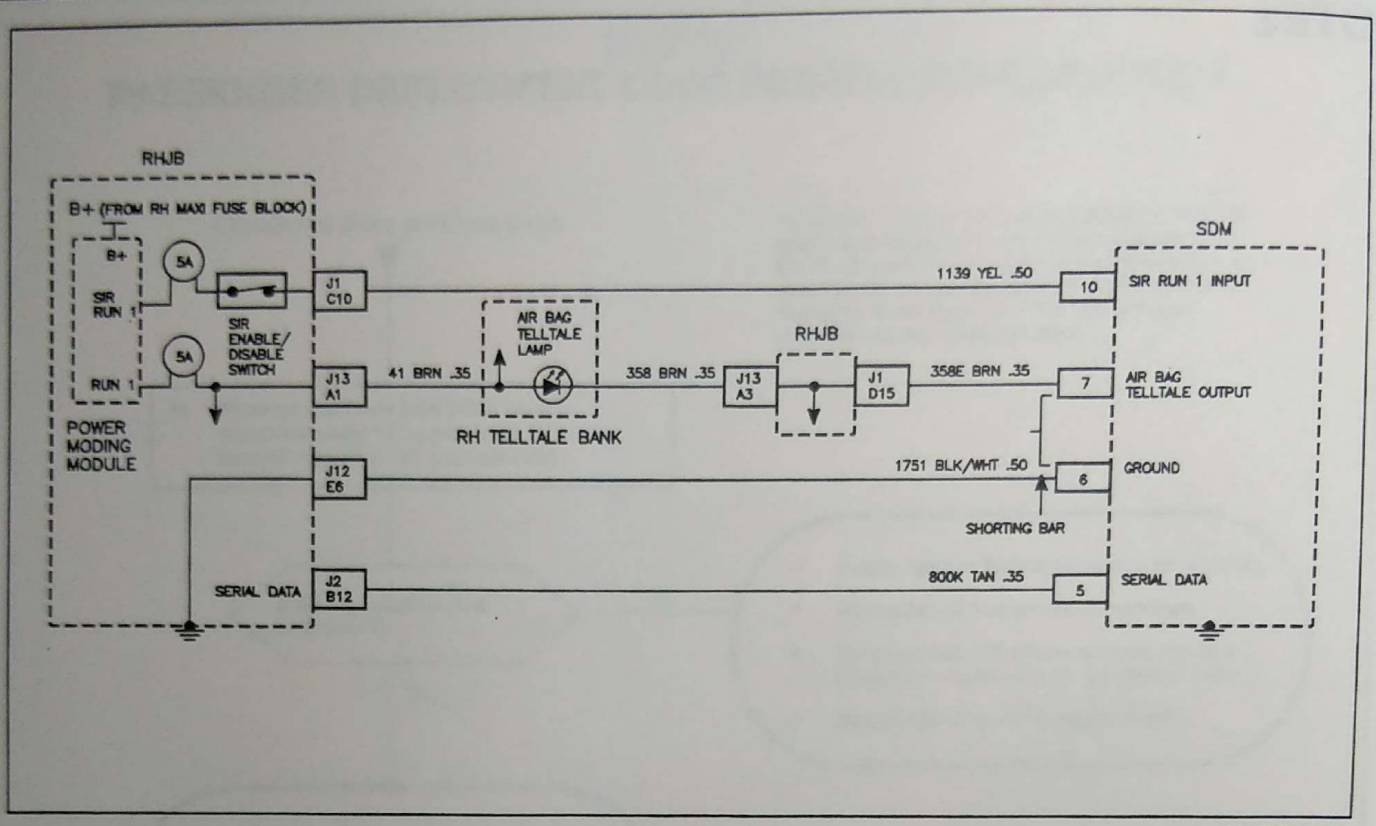

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DTC 16

PASSENGER DEPLOYMENT LOOP RESISTANCE LOW

CIRCUIT DESCRIPTION

When the key pad is placed in the RUN mode the SDM will perform tests to diagnose critical malfunctions within itself. Upon passing these tests "RUN 1," VLR and deployment loop voltages are measured to ensure they are within their respective normal voltage ranges. The SDM then proceeds with the "Current Source Diagnostics." "Passenger Side LO" cavity "4" is grounded through a resistor and the passenger current source connected to "Passenger Side HI" cavity "1" allows a known amount of current to flow. By monitoring the voltage difference between "Passenger Side HI" and "Passenger Side LO" the SDM calculates the combined resistance of the passenger inflator module, harness wiring circuits 1403 and 1404 and connector terminal contact.

DTC WILL SET WHEN:

The combined resistance of the passenger inflator module, harness wiring circuits 1403 and 1404, and connector terminal contact is less than 1 ohm. This test is run once each RUN cycle during the "Current Source Diagnostic" when:

1. No "higher priority faults" are detected during "Turn-On."
2. No "higher priority faults" are detected during "Continuous Monitoring."
3. "RUN 1" voltage is above a specified value.

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 16.

DTC WILL CLEAR WHEN:

The malfunction is no longer occurring and the key pad is placed in the OFF mode, or a PDT "Clear Codes" command is issued.

DIAGNOSTIC AIDS:

An intermittent condition is likely to be caused by a short between circuit 1404 and circuit 347, 348 or 1403, or a malfunctioning shorting bar on the passenger inflator module which would require replacement of the module. The test for this diagnostic trouble code is only run while AIR BAG telltale lamp is performing the bulb check, unless DTC 17 or 26 is detected. When a PDT "Clear Codes" command is issued and the malfunction is still present the DTC will not reappear until the next key pad cycle.

When measurements are requested in this chart use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittence and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

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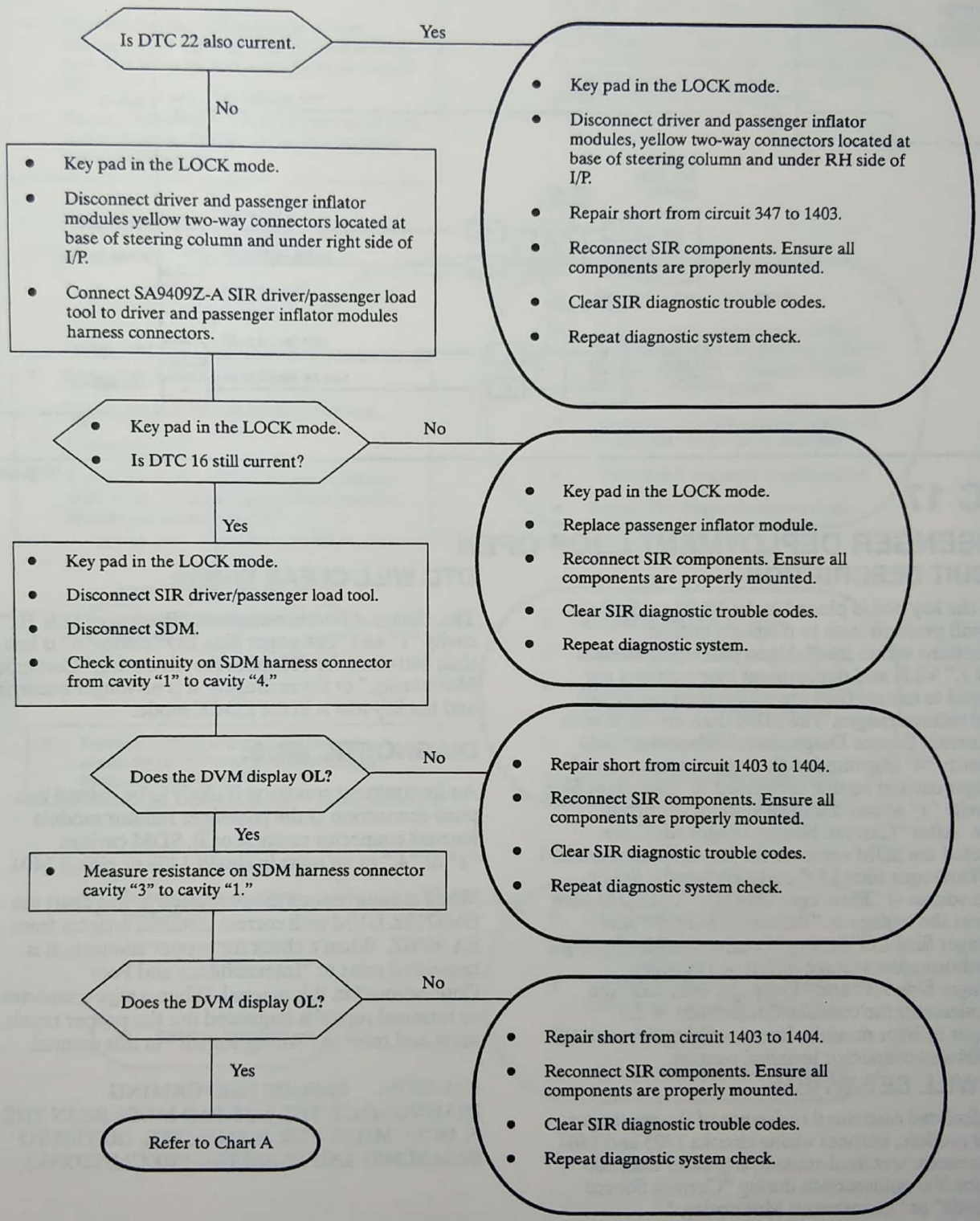
DTC 16
PASSENGER DEPLOYMENT LOOP RESISTANCE HIGH

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)


Is DTC 22 also current.
Yes
No
Key pad in the LOCK mode.
Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
Connect SA9409Z-A SIR driver/passenger load tool to driver and passenger inflator modules harness connectors.
Key pad in the LOCK mode.
Disconnect driver and passenger inflator modules, yellow two-way connectors located at base of steering column and under RH side of I/P.
Repair short from circuit 347 to 1403.
Reconnect SIR components. Ensure all components are properly mounted.
Clear SIR diagnostic trouble codes.
Repeat diagnostic system check.
Key pad in the LOCK mode.
Is DTC 16 still current?
No
Yes
Key pad in the LOCK mode.
Replace passenger inflator module.
Reconnect SIR components. Ensure all components are properly mounted.
Clear SIR diagnostic trouble codes.
Repeat diagnostic system.
Key pad in the LOCK mode.
Disconnect SIR driver/passenger load tool.
Disconnect SDM.
Check continuity on SDM harness connector from cavity "1" to cavity "4."
Does the DVM display OL?
No
Yes
Repair short from circuit 1403 to 1404.
Reconnect SIR components. Ensure all components are properly mounted.
Clear SIR diagnostic trouble codes.
Repeat diagnostic system check.
Measure resistance on SDM harness connector cavity "3" to cavity "1."
Does the DVM display OL?
No
Yes
Repair short from circuit 1403 to 1404.
Reconnect SIR components. Ensure all components are properly mounted.
Clear SIR diagnostic trouble codes.
Repeat diagnostic system check.
Refer to Chart A

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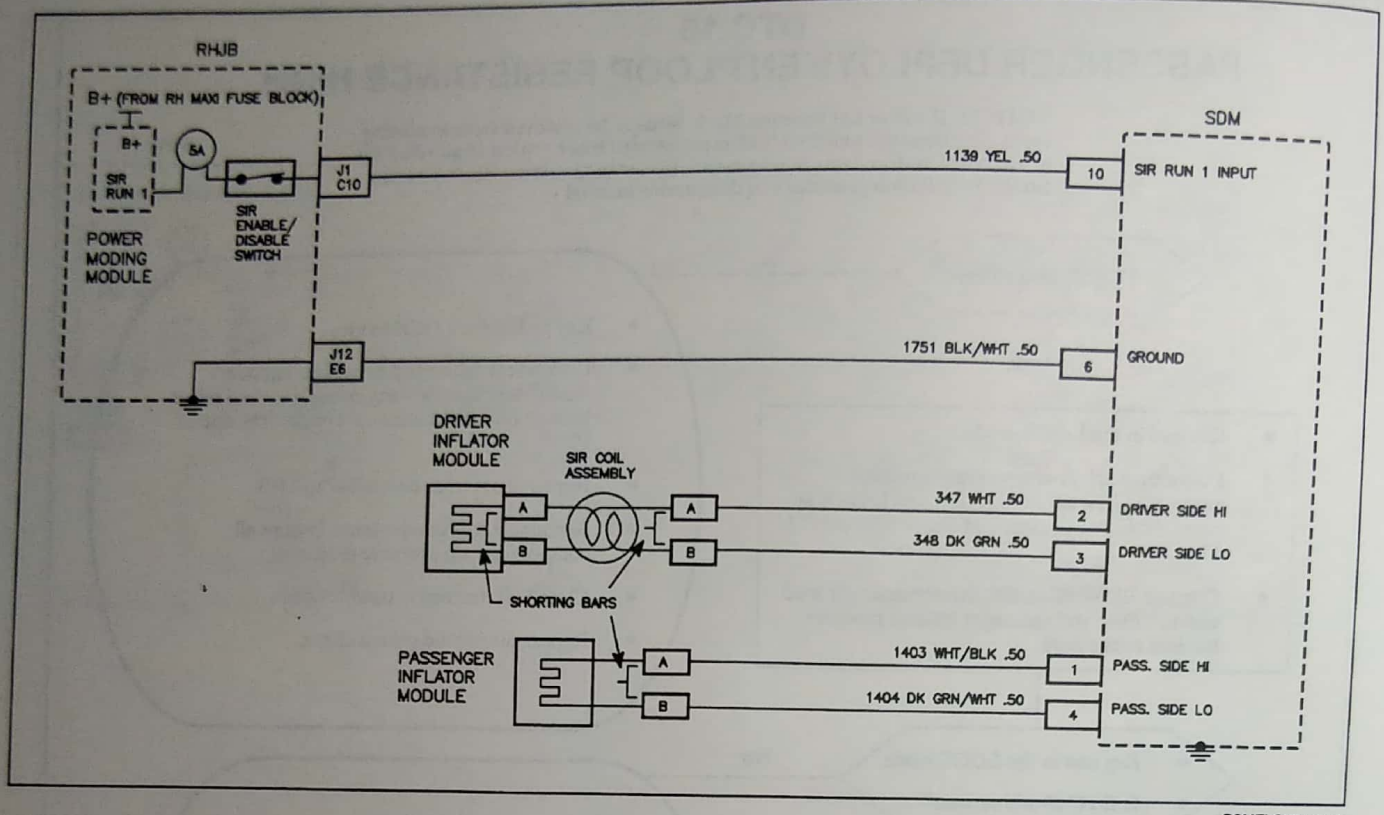

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DTC 17

PASSENGER DEPLOYMENT LOOP OPEN

CIRCUIT DESCRIPTION

When the key pad is placed in the RUN mode the SDM will perform tests to diagnose critical malfunctions within itself. Upon passing these tests "RUN 1," VLR and deployment loop voltages are measured to ensure they are within their respective normal voltage ranges. The SDM then proceeds with the "Current Source Diagnostics." "Passenger Side LO" cavity "4" is grounded through a resistor and the passenger current source connected to "Passenger Side HI" cavity "1" allows a known amount of current to flow. After "Current Source Diagnostics" are completed the SDM removes the low resistance ground from "Passenger Side LO" and switches the driver current source at "Passenger Side HI." The SDM then measures the voltage at "Passenger Side HI" and "Passenger Side LO"during "Continuous Monitoring." By monitoring the voltage difference between "Passenger Side HI" and "Passenger Side LO" the SDM calculates the combined resistance of the passenger inflator module, harness wiring circuits 1403 and 1404 and connector terminal contact.

DTC WILL SET WHEN:

The calculated combined resistance of the passenger inflator module, harness wiring circuits 1403 and 1404 and connector terminal contact, is greater than 500 ohm's for 500 milliseconds during "Current Source Diagnostic" or "Continuous Monitoring."

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 17. DTC 17 takes precedence over DTCs 15, 16, 18, 21, 22 and 24.

DTC WILL CLEAR WHEN:

The voltage difference between "Passenger Side HI" cavity "1" and "Passenger Side LO" cavity "4" is less than 100 ohms for 500 milliseconds during "Continuous Monitoring," or the malfunction is no longer occurring and the key pad is in the LOCK mode.

DIAGNOSTIC AIDS:

An intermittent condition is likely to be caused by a poor connection at the passenger inflator module harness connector cavity A or B, SDM cavities "1" or "4," or an open in circuit 1403 or circuit 1404.

When measurements are requested in this chart use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittence and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

DTC 17
PASSENGER DEPLOYMENT LOOP OPEN

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
- Connect SA9409Z-A SIR driver/passenger load tool to driver and passenger inflator modules harness connectors.

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

- Key pad in the RUN mode.
- Is DTC 17 still current?

No

- Key pad in the LOCK mode.
- Check for poor connection at inflator module, if ok replace passenger inflator module. (Refer to "Passenger Inflator Module" in this manual).
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear all SIR diagnostic trouble codes.
- Repeat SIR diagnostic system check.

Yes

- Key pad in the LOCK mode.
- Disconnect SIR driver/passenger load tool.
- Disconnect SDM.
- Check continuity on SDM harness connector from cavity "1" to passenger inflator module harness connector cavity "A."

Is there continuity (low resistance)?

No

- Key pad in the LOCK mode.
- Repair high resistance in circuit 1403.
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat SIR diagnostic system check.

Yes

- Measure resistance from SDM harness connector cavity "4" to passenger inflator harness connector "B."

Is there continuity (low resistance)?

No

- Key pad in the LOCK mode.
- Repair high resistance in circuit 1403.
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat SIR diagnostic system check.

Yes

- Refer to Chart A.

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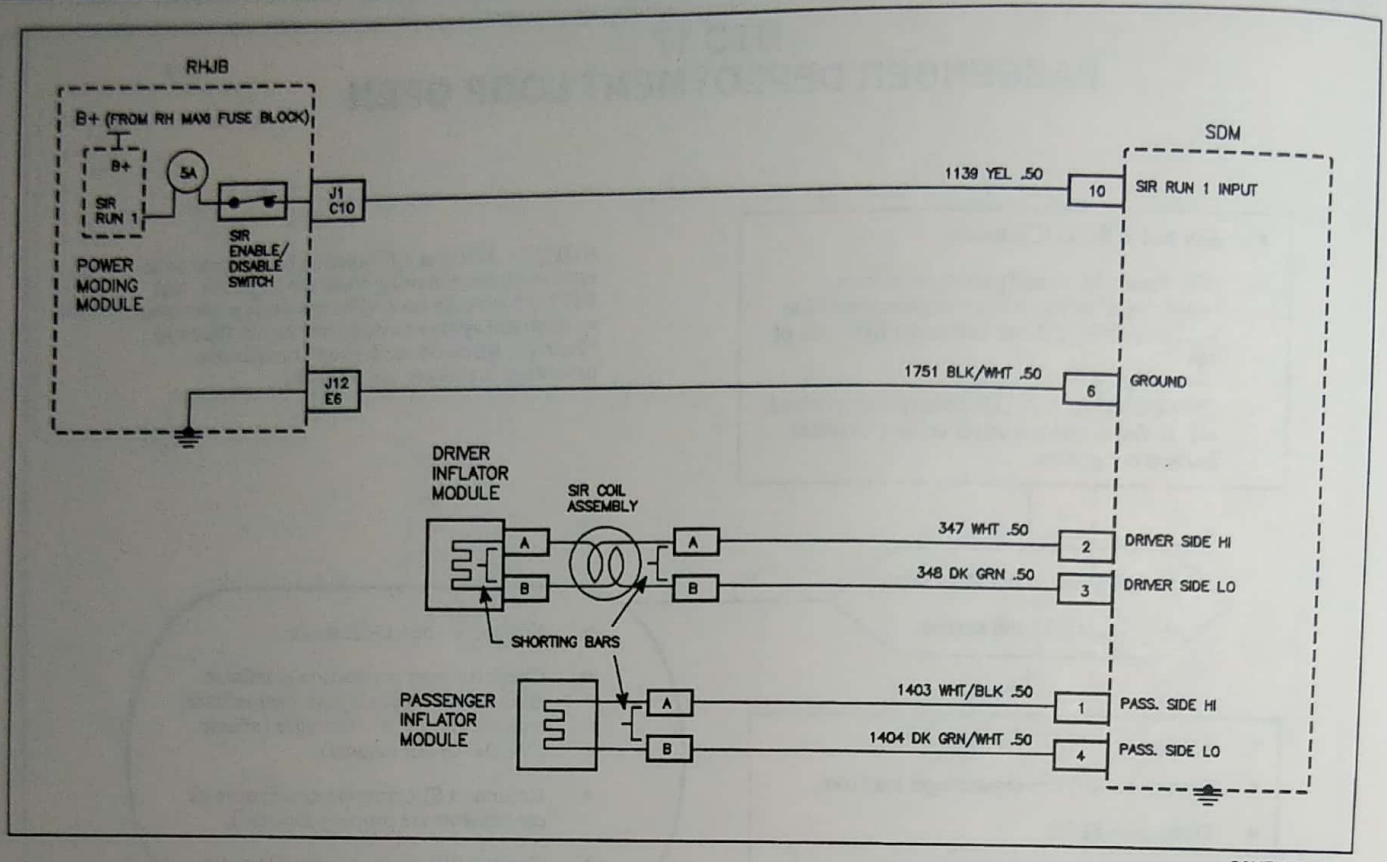

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DTC 18

PASSENGER DEPLOYMENT LOOP SHORT TO GROUND

CIRCUIT DESCRIPTION

When the key pad in the RUN mode the SDM will perform tests to diagnose critical malfunctions within itself. Upon passing these tests "RUN 1," VLR and deployment loop voltages are measured to ensure they are within their respective normal voltage ranges. The SDM monitors the voltage at "Driver Side LO" cavity "2" and "Passenger Side LO" cavity "4" to detect shorts in ground in the passenger inflator module circuits.

DTC WILL SET WHEN:

The VLR power supply in the SDM is in its normal operating voltage range and at least one of the two inflator modules is not open. Then, if the voltage measured at "Driver Side LO" is greater than three volts and the voltage measured at "Passenger Side LO" is less than or equal to three volts for 500 milliseconds during "Continuous Monitoring" or "Current Source Diagnostic," DTC 18 will set.

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 18 and DTC 71. DTC 18 will take precedence over DTCs 15, 16, 21 and 22.

DTC WILL CLEAR WHEN:

The fault condition is no longer present and the SDM is replaced. DTC 18 will remain current, regardless if the key pad is in the LOCK mode or a PDT "Clear Codes" command is issued, until the faulty wiring or component is repaired or replaced and the SDM is replaced.

DIAGNOSTIC AIDS:

It is critical to diagnose all circuitry before replacing the SDM. If the malfunction still exists the new SDM will be damaged. An intermittent condition is likely to be caused by a short to ground in the passenger inflator module circuits. Inspect circuits 1403 and 1404 carefully for cutting or chafing. If the wiring pigtail of the passenger inflator module is damaged the module must be replaced. If no circuit or component failures are located, *after a complete and thorough inspection,* the fault may have occurred internally to the SDM.

The test for this diagnostic trouble code is run during "Continuous Monitoring" and "Current Source Diagnostics," unless DTC 17 or 26 is detected.

When measurements are requested in this chart use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittence and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: DURING SERVICE PROCEDURES, BE VERY CAREFUL WHEN HANDLING A SENSING AND DIAGNOSTIC MODULE (SDM). NEVER STRIKE OR JAR THE SDM. NEVER POWER UP THE SIR SYSTEM WHEN THE SDM IS NOT RIGIDLY ATTACHED TO THE VEHICLE. ALL SDM AND MOUNTING BRACKET FASTENERS MUST BE CAREFULLY TORQUED AND THE ARROW MUST BE POINTING TOWARD THE FRONT OF THE VEHICLE TO ENSURE PROPER OPERATION

OF THE SIR SYSTEM. THE SDM COULD BE ACTIVATED WHEN POWERED WHILE NOT RIGIDLY ATTACHED TO THE VEHICLE WHICH COULD CAUSE DEPLOYMENT AND RESULT IN PERSONAL INJURY.

CAUTION: BEFORE PERFORMING DIAGNOSTICS THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

NOTICE: When DTC 18 has been set it is necessary to replace the SDM. Setting DTC 18 will also cause DTC 71 to set. When a PDT "Clear Codes" command is issued and the malfunction is still present diagnostic trouble codes 18 and 71 will remain current. Ensure that the short to ground is repaired prior to installing a replacement SDM to avoid damaging the SDM.

DTC 18
PASSENGER DEPLOYMENT LOOP SHORT TO GROUND
WAS THE "SIR DIAGNOSTIC SYSTEM PERFORMANCE PERFORMED?"

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
- Connect SA9409Z-A SIR driver/passenger load tool to driver and passenger inflator modules harness connectors.
- Key pad in the RUN mode.
- Using the PDT, display Passenger Sense LO Voltage (PASS SENS VOLT).

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

- Key pad in the RUN mode.
- Is passenger sense LO Voltage less than 3.3 volts?

No

- Check for wiring damage at inflator module. If ok replace passenger inflator module. (Refer to "Passenger Inflator Module" in this manual.)
- Replace SDM. (Refer to "Sensing and Diagnostic Module (SDM)" in this manual.)
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system.

Yes

- Key pad in the LOCK mode.
- Disconnect SIR driver/passenger load tool.
- Disconnect SDM.
- Check continuity on SDM harness connector from cavity "1" to cavity "4."

Does the DVM display **OL?**

No

- Repair short from circuit 1404 to ground.
- Replace SDM. (Refer to "Sensing and Diagnostic module (SDM)" in this manual.)
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

Yes

- Measure resistance on SDM harness connector cavity "1" to cavity "6."

Does the DVM display **OL?**

No

- Repair short from circuit 1403 to ground.
- Replace SDM. (Refer to "Sensing and Diagnostic Module (SDM)" in this manual.)
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

Yes

Refer to Chart A

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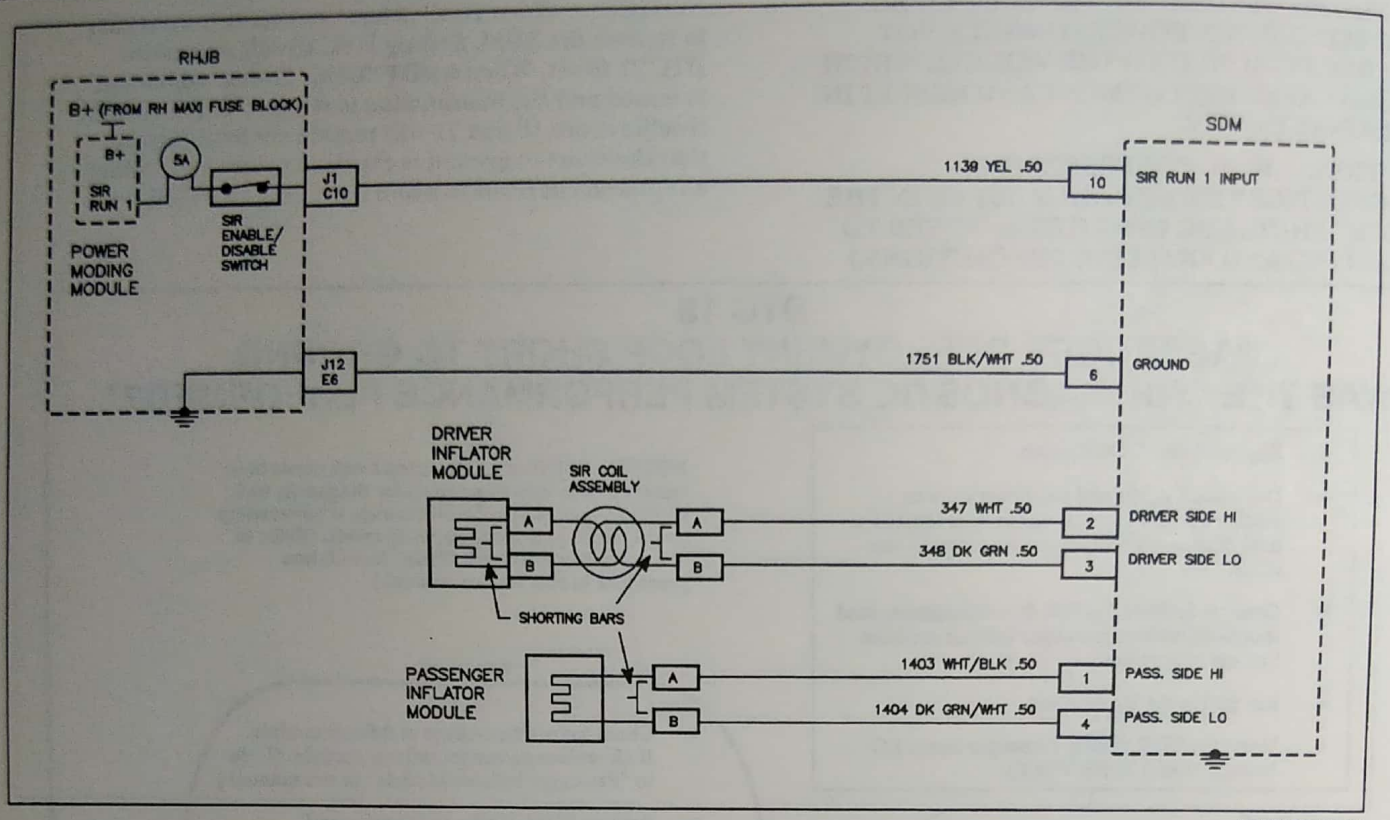

PSMELC67416AA

DTC 19

PASSENGER DEPLOYMENT LOOP SHORT TO VOLTAGE

CIRCUIT DESCRIPTION

When the key is placed in the RUN mode the SDM will perform tests to diagnose critical malfunctions within itself. Upon passing these tests "RUN 1," VLR and deployment loop voltages are measured to ensure they are within their respective normal voltage ranges. The SDM monitors the voltage at "Driver Side LO" cavity "3" and "Passenger Side LO" cavity "4" to detect shorts to B+ or RUN 1 voltage in the inflator module circuits.

DTC WILL SET WHEN:

The VLR power supply in the SDM is in its normal operating voltage range and neither of the two inflator modules is open. Then, if the voltage measured at "Driver Side LO" is less than five volts, and the voltage measured at "Passenger Side LO" is greater than or equal to five volts for 500 milliseconds during "Continuous Monitoring," DTC 19 will set. DTC 19 will take precedence over DTCs 15, 16, 21, 22 and 24.

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp, sets DTC 19. DTC 19 will take precedence over DTCs 15, 16, 21, 22 and 24.

DTC WILL CLEAR WHEN:

The voltage measured at "Passenger Side LO" is less than four volts for 500 milliseconds during "Continuous Monitoring," or the malfunction no longer exists and the key pad is in the LOCK mode.

DIAGNOSTIC AIDS:

An intermittent condition is likely to be caused by a short to B+ or RUN 1 voltage in the passenger inflator module circuits. Inspect circuits 1403 and 1404 carefully for cutting or chafing. If the wiring of the passenger inflator module is damaged, the module must be replaced.

When measurements are requested in this chart, use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested, refer to "Intermittence and Poor Connections" in this manual. When a wire connector or terminal repair is requested, use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

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DTC 19
PASSENGER DEPLOYMENT LOOP SHORT TO VOLTAGE
WAS THE "SIR DIAGNOSTIC SYSTEM CHECK PERFORMED"?

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
- Connect driver and passenger load tool SA94092-A to passenger inflator modules harness connectors.

NOTICE: If either the RH or LH junction block must be removed from mounting studs for diagnosis, tool EV9713Z must be installed to maintained when vehicle is powered-up electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this manual.)

- Key pad in the RUN mode.
- Is DTC 19 still current?

No

- Key pad in the LOCK mode.
- Inspect passenger inflator module and circuits damage. If ok, replace passenger inflator module. (Refer to "Passenger Inflator Module" in this manual.)
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear all SIR diagnostic trouble codes.
- Repeat SIR diagnostic system check.

Yes

- Key pad in the LOCK mode.
- Disconnect SIR driver/passenger load tool.
- Disconnect SDM.
- Measure voltage on SDM harness connector from cavity "1" to cavity "6."

Is voltage one volt or less?

No

- Key pad in the LOCK mode.
- Repair high resistance in circuit 1403 to Run 1 voltage or circuit 1139.
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat SIR diagnostic system check.

Yes

- Measure resistance from SDM harness connector cavity "4" to cavity "6."

Is voltage one volt or less?

No

- Key pad in the LOCK mode.
- Repair high resistance in circuit 1404 to B+ or Run 1 circuit 1139.
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat SIR diagnostic system check.

Yes

- Refer to Chart A.

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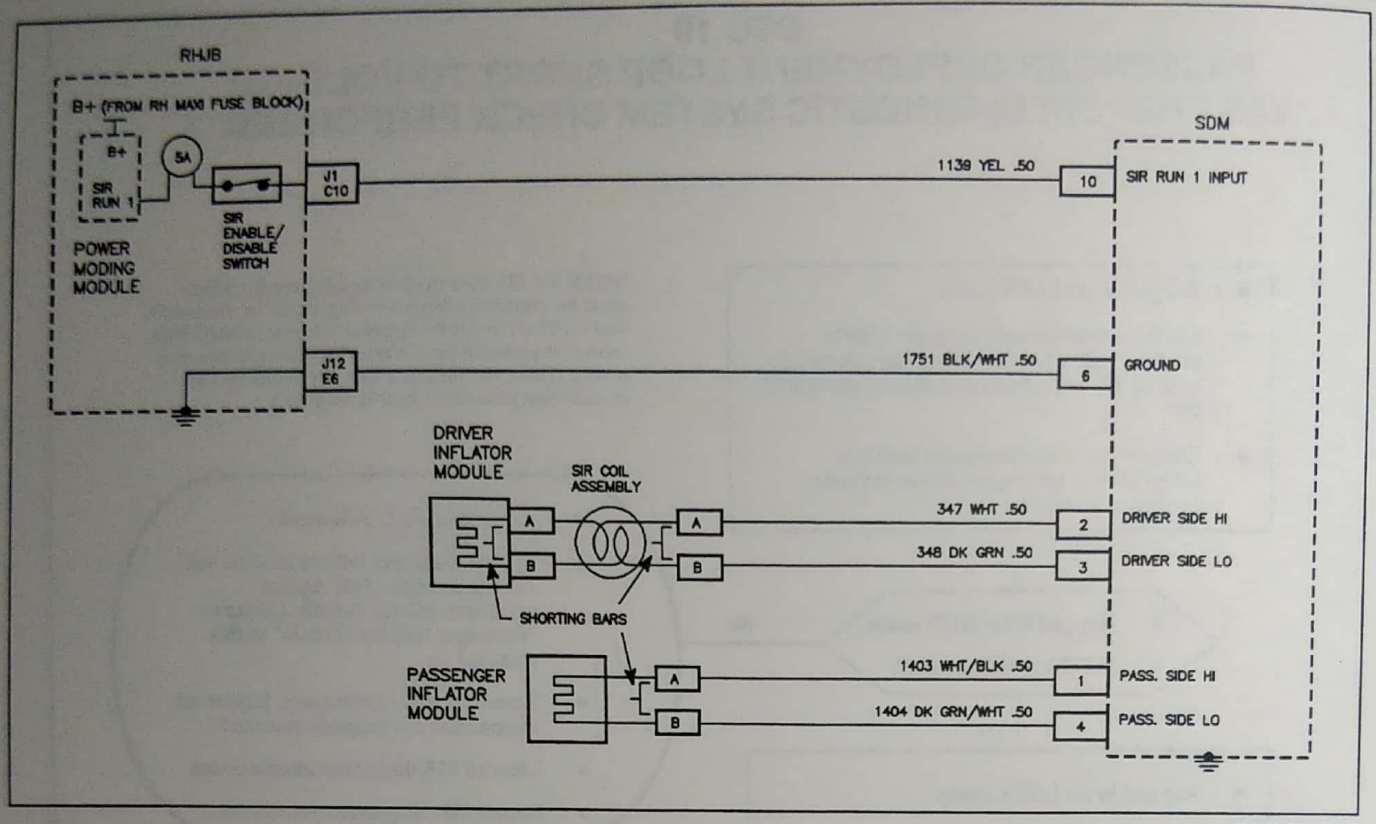

PSMELC67416AA

DTC 21

DRIVER DEPLOYMENT LOOP RESISTANCE HIGH

CIRCUIT DESCRIPTION

When the key pad is placed in the RUN mode the SDM will perform tests to diagnose critical malfunctions within itself. Upon passing these tests "RUN 1," VLR and deployment loop voltages are measured to ensure they are within their respective normal voltage ranges. The SDM then proceeds with the "Current Source Diagnostics." "Driver Side LO" cavity "3" is grounded through a resistor and the driver current source connected to "Driver Side HI" cavity "2" allows a known amount of current to flow. By monitoring the voltage difference between "Driver Side HI" and "Driver Side LO" the SDM calculates the combined resistance of the driver inflator module, SIR coil assembly, harness wiring circuits 347 and 348 and connector terminal contact.

DTC WILL SET WHEN:

The combined resistance of the driver inflator module, harness wiring circuits 347 and 348 and connector terminal contact is greater than 4.5 ohms. This test is run once each key pad cycle during the "Current Source Diagnostics" when:

1. No "higher priority faults" are detected during "Turn-On."
2. No "higher priority faults" are detected during "Continuous Monitoring."
3. "RUN 1" voltage is above a specified value.

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 21.

DTC WILL CLEAR WHEN:

The malfunction is no longer occurring and the key pad is in the LOCK mode, or a PDT "Clear Codes" command is issued.

DIAGNOSTIC AIDS:

An intermittent condition is likely to be caused by a poor connection at cavities "A" or "B" of the SIR coil connector at the base of the steering column, cavities "A" or "B" of the driver inflator module connector at the top of the steering column, SDM cavities "2" or "3" or a poor wire to terminal connection in circuit 347 or 348. The test for this diagnostic trouble code is only run while the AIR BAG telltale lamp is performing the bulb check, unless DTC 17 or 26 is detected. When a PDT "Clear Codes" command is issued and the malfunction is still present, the DTC will not reappear until the next key pad cycle.

When measurements are requested in this chart, use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested, refer to "Intermittence and Poor Connections" in this manual. When a wire connector or terminal repair is requested, use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

DTC 21
DRIVER DEPLOYMENT LOOP RESISTANCE HIGH
WAS THE "SIR DIAGNOSTIC SYSTEM CHECK PERFORMED"?

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
- Connect SA9409Z-A driver and passenger load tool to driver and passenger inflator modules harness connectors.

- Key pad in the RUN mode.
- Is DTC 21 current?

No

Yes

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
- Disconnect SDM.
- Measure resistance from SDM harness connector from cavity "2" to driver inflator module harness connector cavity "A."

Is there continuity (low resistance)?

Yes

- Measure resistance from SDM harness connector cavity "3" to driver inflator module harness connector "B."

Is there continuity (low resistance)?

No

Yes

- Refer to Chart A.

- Repair high resistance or open in circuit 348.
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

No

- Key pad in the LOCK mode.
- Disconnect SIR driver/passenger load tool from driver inflator module harness connector.
- Remove inflator module from steering wheel. (Refer to "Driver Inflator Module" in this manual.)
- Connect driver/passenger load tool to inflator module connector at steering wheel.
- Reconnect driver inflator module harness connector.

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

- Key pad in the LOCK mode.
- Is DTC 21 current?

No

Yes

- Key pad in the LOCK mode.
- Replace SIR coil assembly. (Refer to "SIR Coil Assembly" in this manual.)
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

- Key pad in the LOCK mode.
- Replace driver inflator module. (Refer to "Driver Inflator Module" in this manual.)
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

No

- Repair high resistance or open in circuit 348.
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

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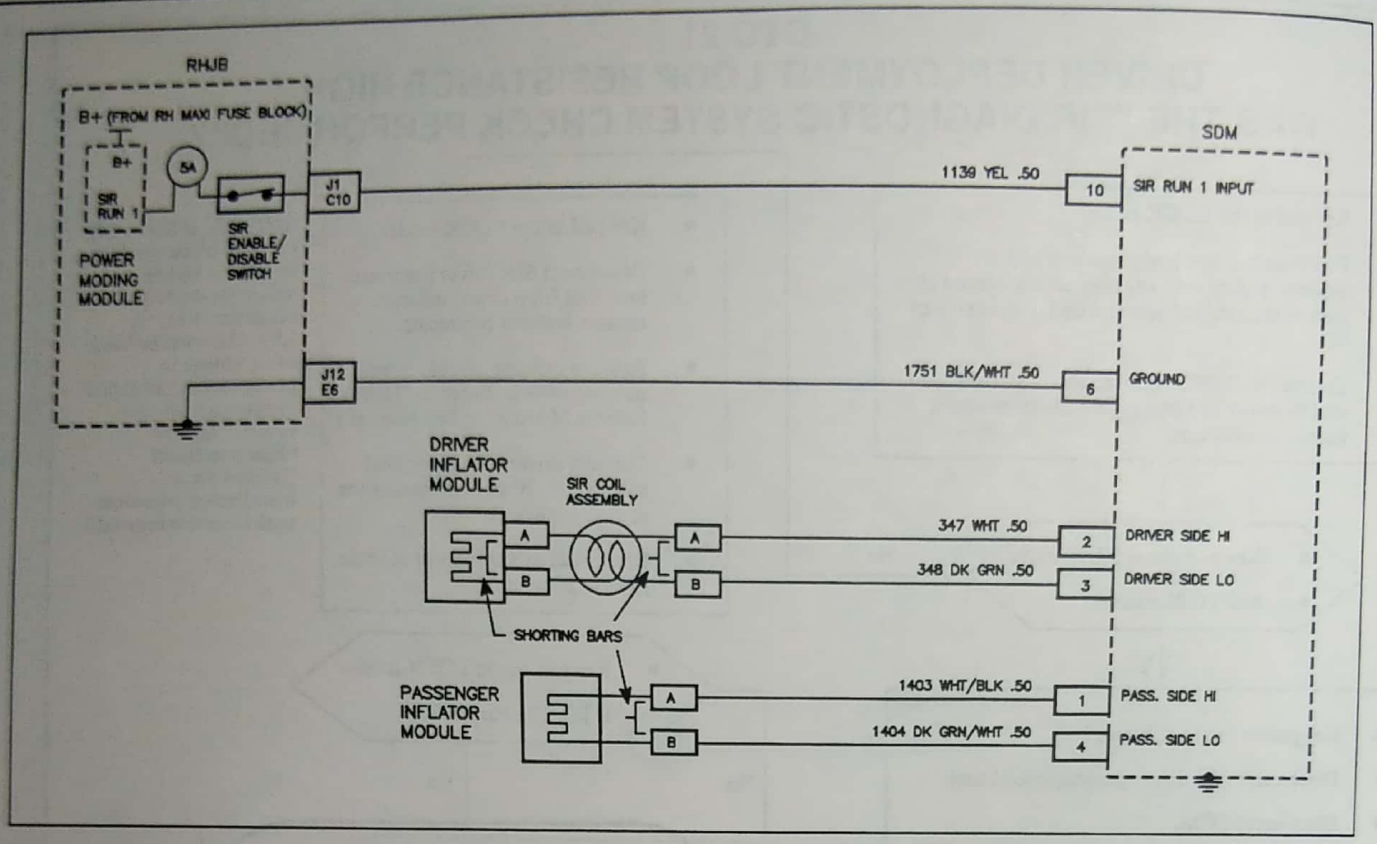

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DTC 22

DRIVER DEPLOYMENT LOOP RESISTANCE LOW

CIRCUIT DESCRIPTION

When the key pad is in the RUN mode the SDM will perform tests to diagnose critical malfunctions within itself. Upon passing these tests "RUN 1," VLR and deployment loop voltages are measured to ensure they are within their respective normal voltage ranges. The SDM then proceeds with the "Current Source Diagnostics." "Driver Side LO" cavity "3" is grounded through a resistor and the driver current source connected to "Driver Side HI" cavity "2" allows a known amount of current to flow. By monitoring the voltage difference between "Driver Side HI" and "Driver Side LO" the SDM calculates the combined resistance of the driver inflator module, SIR coil assembly, harness wiring circuits 347 and 348 and connector terminal contact.

DTC WILL SET WHEN:

The combined resistance of the driver inflator module, SIR coil assembly, harness wiring circuits 347 and 348 and connector terminal contact is less than 1.2 ohms. This test is run during the "Current Source Diagnostics" when:

1. No "higher priority faults" are detected during "Turn-On."
2. No "higher priority faults" are detected during "Continuous Monitoring."
3. "RUN 1" voltage is above a specified value.

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 22.

DTC WILL CLEAR WHEN:

The malfunction is no longer occurring and the key pad is in the LOCK mode, or a PDT "Clear Codes" command is issued.

DIAGNOSTIC AIDS:

An intermittent condition is likely to be caused by a short between circuits 347 and 348, 1403 or 1404 or a malfunctioning shorting bar on the driver inflator module or SIR coil assembly which would require replacement of the component. The test for this diagnostic trouble code is only run while the AIR BAG telltale lamp is performing the bulb check, unless DTC 17 or 26 is detected. When a PDT "Clear Codes" command is issued and the malfunction is still present, the DTC will not reappear until the next key pad cycle.

When measurements are requested in this chart, use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested, refer to "Intermittence and Poor Connections" in this manual. When a wire connector or terminal repair is requested, use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

DTC 22
DRIVER DEPLOYMENT LOOP RESISTANCE LOW
WAS THE "SIR DIAGNOSTIC SYSTEM CHECK PERFORMED"?

- Key pad in the RUN mode.
- Is DTC 21 current?

Yes

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
- Repair short from circuit 347 to 1403.
- Clear SIR diagnostic trouble codes.
- Reconnect all SIR components. Ensure all components are properly mounted.

No

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
- Connect SA9409Z-A driver and passenger load tool to driver and passenger inflator modules harness connectors.

- Key pad in the RUN mode.
- Is DTC 22 current?

No

- Key pad in the LOCK mode.
- Disconnect driver/passenger load tool from driver inflator harness connector.
- Remove inflator module from steering wheel. (Refer to "Driver Inflator Module" in this manual.)
- Connect driver/passenger load tool to inflator module connector at steering wheel.
- Reconnect driver inflator module connector at base of steering column.

- Key pad in the RUN mode.
- Is DTC 22 current?

No

- Key pad in the LOCK mode.
- Replace driver inflator module. (Refer to driver inflator module in this manual.)
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

Yes

- Key pad in the LOCK mode.
- Replace SIR coil assembly. (Refer to "SIR Coil Assembly" in this manual.)
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

Yes

- Key pad in the LOCK mode.
- Disconnect SIR driver/passenger load tool.
- Disconnect SDM.
- Measure resistance from SDM harness connector from cavity "2" to driver inflator module harness connector cavity "A."

Does the DVM display **OL?**

Yes

- Measure resistance on SDM harness connector cavity "2" to cavity "4."

Does the DVM display **OL?**

No

Refer to Chart A

No

Yes

- Repair short from circuit 347 to circuit 348.
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

- Repair short from circuit 347 to circuit 348
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

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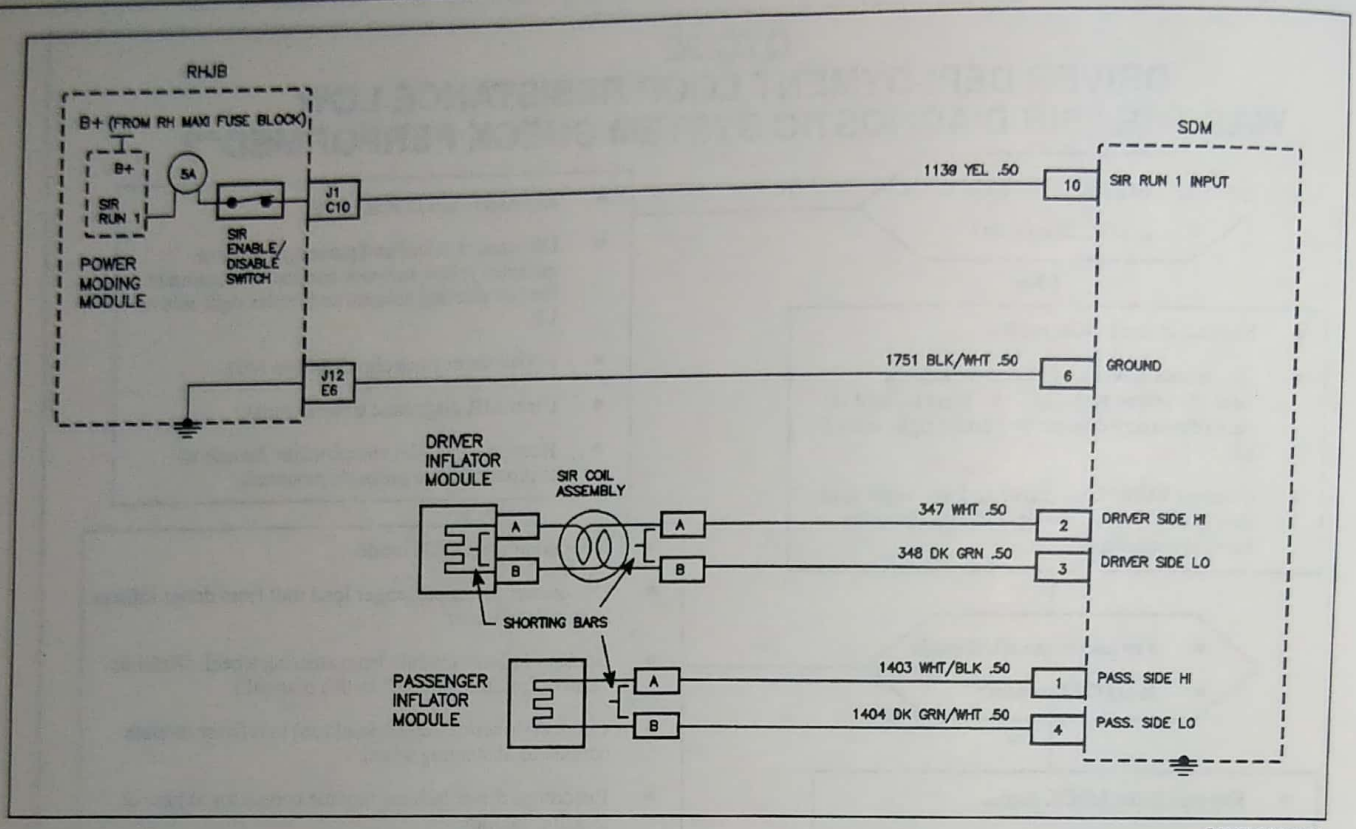

PSMELC67416AA

DTC 24

DRIVER DEPLOYMENT LOOP SHORT TO GROUND

CIRCUIT DESCRIPTION

When the key pad is placed in the RUN mode the SDM will perform tests to diagnose critical malfunctions within itself. Upon passing these tests "RUN 1," VLR and deployment loop voltages are measured to ensure they are within their respective normal voltage ranges. The SDM monitors the voltage at "Driver Side LO" cavity "3" and "Passenger Side LO" cavity "4" to detect shorts in ground in the inflator module circuits.

DTC WILL SET WHEN:

The VLR power supply in the SDM is in its normal operating voltage range and at least one of the two inflator modules is not open. Then, if the voltage measured at "Driver Side LO" is less than or equal to three volts and the voltage measured at "Passenger Side LO" is greater than three volts for 500 milliseconds during "Continuous Monitoring" or "Current Source Diagnostics," DTC 24 will set.

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 24, and DTC 71. DTC 24 will take precedence over DTCs 21 and 22.

DTC WILL CLEAR WHEN:

The fault condition is removed and the SDM is replaced. DTC 24 will remain current, regardless if the key pad is placed in the LOCK mode or a PDT "Clear Codes" command is issued, until the faulty wiring or component is repaired or replaced and the SDM is replaced.

DIAGNOSTIC AIDS:

It is critical to diagnose all circuitry before replacing the SDM. If the malfunction still exists the new SDM will be damaged. An intermittent condition is likely to be caused by a short to ground in the driver inflator module circuits.

Inspect circuits 347 and 348 carefully for cutting or chafing. If the wiring pigtail of the SIR coil assembly or the driver inflator module is damaged, the component must be replaced. If no wiring or component failures are diagnosed, *after a complete and thorough inspection*, the fault may have occurred internally to the SDM.

The test for this diagnostic trouble code is run during "Continuous Monitoring" and "Current Source Diagnostics," unless DTC 17 or 26 is detected.

When measurements are requested in this chart use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittents and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: DURING SERVICE PROCEDURES, BE VERY CAREFUL WHEN HANDLING A SENSING AND DIAGNOSTIC MODULE (SDM). NEVER STRIKE OR JAR THE SDM. NEVER POWER UP THE SIR SYSTEM WHEN THE SDM IS NOT RIGIDLY ATTACHED TO THE VEHICLE. ALL SDM AND MOUNTING BRACKET FASTENERS MUST BE CAREFULLY TORQUED AND THE ARROW MUST BE POINTING TOWARD THE FRONT OF

THE VEHICLE TO ENSURE PROPER OPERATION OF THE SIR SYSTEM. THE SDM COULD BE ACTIVATED WHEN POWERED WHILE NOT RIGIDLY ATTACHED TO THE VEHICLE WHICH COULD CAUSE DEPLOYMENT AND RESULT IN PERSONAL INJURY.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

NOTICE: When DTC 24 has been set it is necessary to replace the SDM. Setting DTC 24 will also cause DTC 71 to set. When a PDT "Clear Codes" command is issued and the malfunction is still present diagnostic trouble codes 24 and 71 will remain current. Ensure that the short to ground is repaired prior to installing a replacement SDM to avoid damaging the SDM.

DTC 24
DRIVER DEPLOYMENT LOOP SHORT TO GROUND
WAS THE "SIR DIAGNOSTIC SYSTEM CHECK PERFORMED"?

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
- Connect SA9409Z-A driver and passenger load tool to driver and passenger inflator modules harness connectors.

Is the driver sense LO voltage less than 3.3 volts?

No

- Key pad in the LOCK mode.
- Remove inflator module from steering wheel. (Refer to "Driver Inflator Module" in this manual.)
- Reconnect yellow two-way connector at base of steering column.
- Connect SIR driver/passenger load tool to inflator module connector at steering wheel.

Is the driver sense LO voltage less than 3.3 volts?

No

- Key pad in the LOCK mode.
- Replace SIR coil assembly. (Refer to "SIR Coil Assembly" in this manual.)
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

Yes

- Key pad in the LOCK mode.
- Replace driver inflator module. (Refer to "Driver Inflator Module" in this manual.)
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

Yes

- Key pad in the LOCK mode.
- Disconnect SDM.
- Measure resistance from SDM harness connector cavity "2" to driver inflator module harness connector cavity "A."

Does the DVM display **OL?**

No

- Repair short from circuit 347 to ground
- Replace SDM. (Refer to "Sensing and Diagnostic Module" (SDM) in this manual).
- Reconnect all SIR components. Ensure all components are properly mounted.
- Repeat diagnostic system check.

Yes

- Measure resistance on SDM harness connector cavity "3" to cavity "6" (ground).

Does the DVM display **OL?**

No

- Repair short from circuit 348 to ground
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

Yes

Refer to Chart A

No

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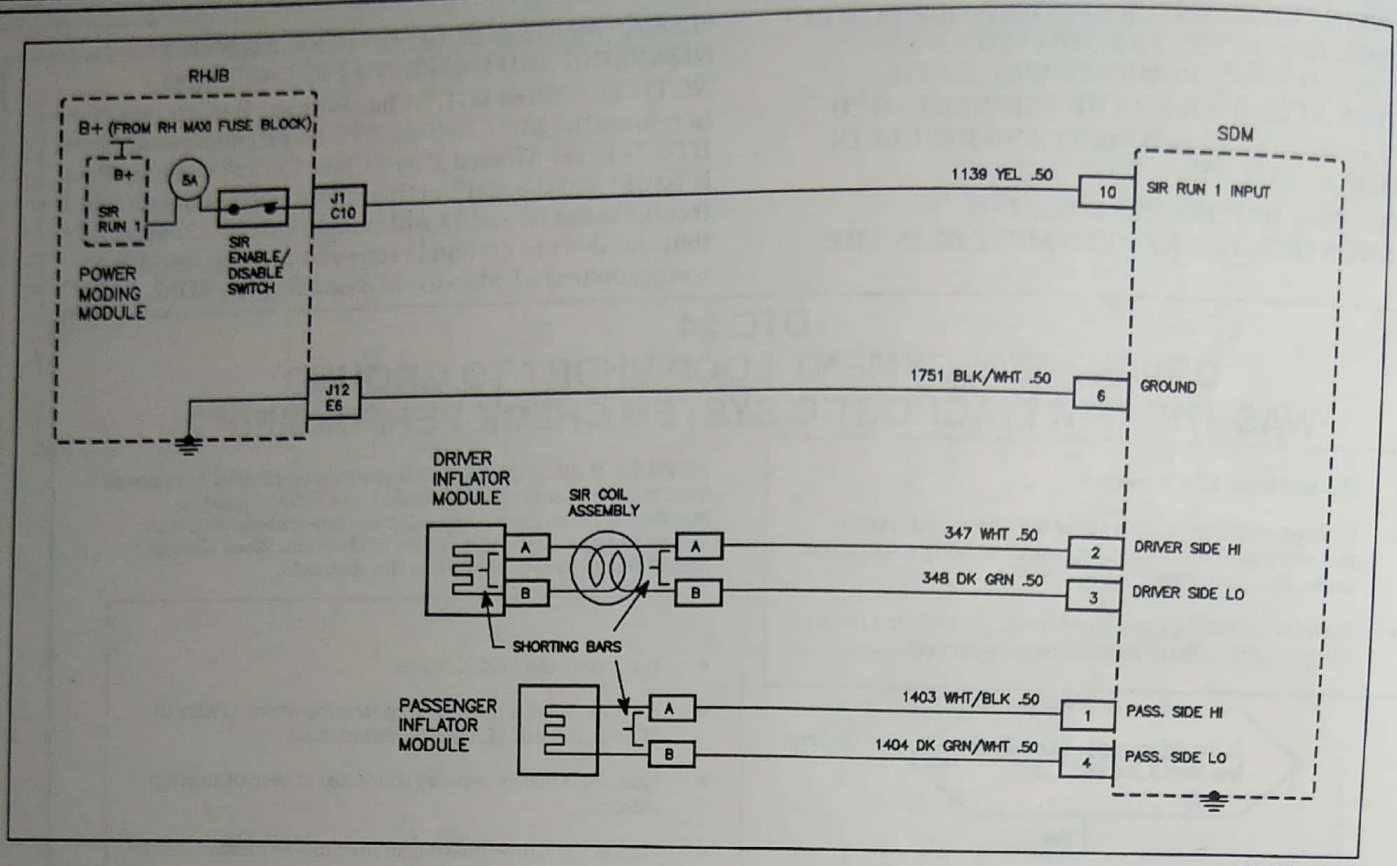

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DTC 25

DRIVER DEPLOYMENT LOOP SHORT TO VOLTAGE

CIRCUIT DESCRIPTION

When the key pad is placed in the RUN mode the SDM will perform tests to diagnose critical malfunctions within itself. Upon passing these tests "RUN 1," VLR and deployment loop voltages are measured to ensure they are within their respective normal voltage ranges. The SDM monitors the voltage at "Driver Side LO" cavity "3" and "Passenger Side LO" cavity "4" to detect shorts to B+ or RUN 1 in the inflator module circuits.

DTC WILL SET WHEN:

The VLR power supply in the SDM is in its normal operating voltage range and neither of the two inflator modules is open. Then, if the voltage measured at "Driver Side LO" is greater or equal to five volts and the voltage measured at "Passenger Side LO" is less than five volts for 500 milliseconds during "Continuous Monitoring" or "Current Source Diagnostics," DTC 25 will set.

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 25. DTC 25 will take precedence over DTCs 15, 16, 28, 21 and 22.

DTC WILL CLEAR WHEN:

The voltage measured at "Driver Side LO" is less than 4 volts for 500 milliseconds during "Continuous Monitoring," or the malfunction no longer exists and the key pad is placed in the LOCK mode.

DIAGNOSTIC AIDS:

An intermittent condition is likely to be caused by a short to B+ or RUN 1 in the driver inflator module circuits. Inspect circuits 347 and 348 carefully for cutting or chafing. If the wiring pigtail of the SIR coil assembly or the driver inflator module is damaged the component must be replaced.

When measurements are requested in this chart use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittents and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

DTC 25
DRIVER DEPLOYMENT LOOP SHORT TO VOLTAGE
WAS THE "SIR DIAGNOSTIC SYSTEM CHECK PERFORMED"?

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

- Key pad in the LOCK mode.
- Disconnect driver inflator module, yellow two-way connector located at base of steering column. (Driver inflator module only.)
- Connect driver and passenger load tool SA94092-A to driver inflator modules harness connector at base of steering column.

- Key pad in the RUN mode.
- Is DTC 25 current?

No

- Key pad in the LOCK mode.
- Inspect passenger inflator module and circuits damage. If ok, replace passenger inflator module. (Refer to "Passenger Inflator Module" in this manual.)
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear all SIR diagnostic trouble codes.

Yes

- Key pad in the LOCK mode.
- Disconnect driver/passenger load tool.
- Disconnect SDM.
- Key pad in the RUN mode.
- Measure voltage on SDM harness connector from cavity "2" to cavity "6" (ground).

Is voltage one volt or less?

No

- Key pad in the LOCK mode.
- Repair short from circuit 347 to B+ or Run 1 circuit 1139.
- Reconnect all SIR system components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

Yes

- Measure resistance from SDM harness connector cavity "3" to cavity "6" (ground).

Is voltage one volt or less?

No

- Key pad in the LOCK mode.
- Repair short from circuit 348 to B+ or Run 1 circuit 1139.
- Reconnect all SIR system components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system check.

Yes

- Refer to Chart A.

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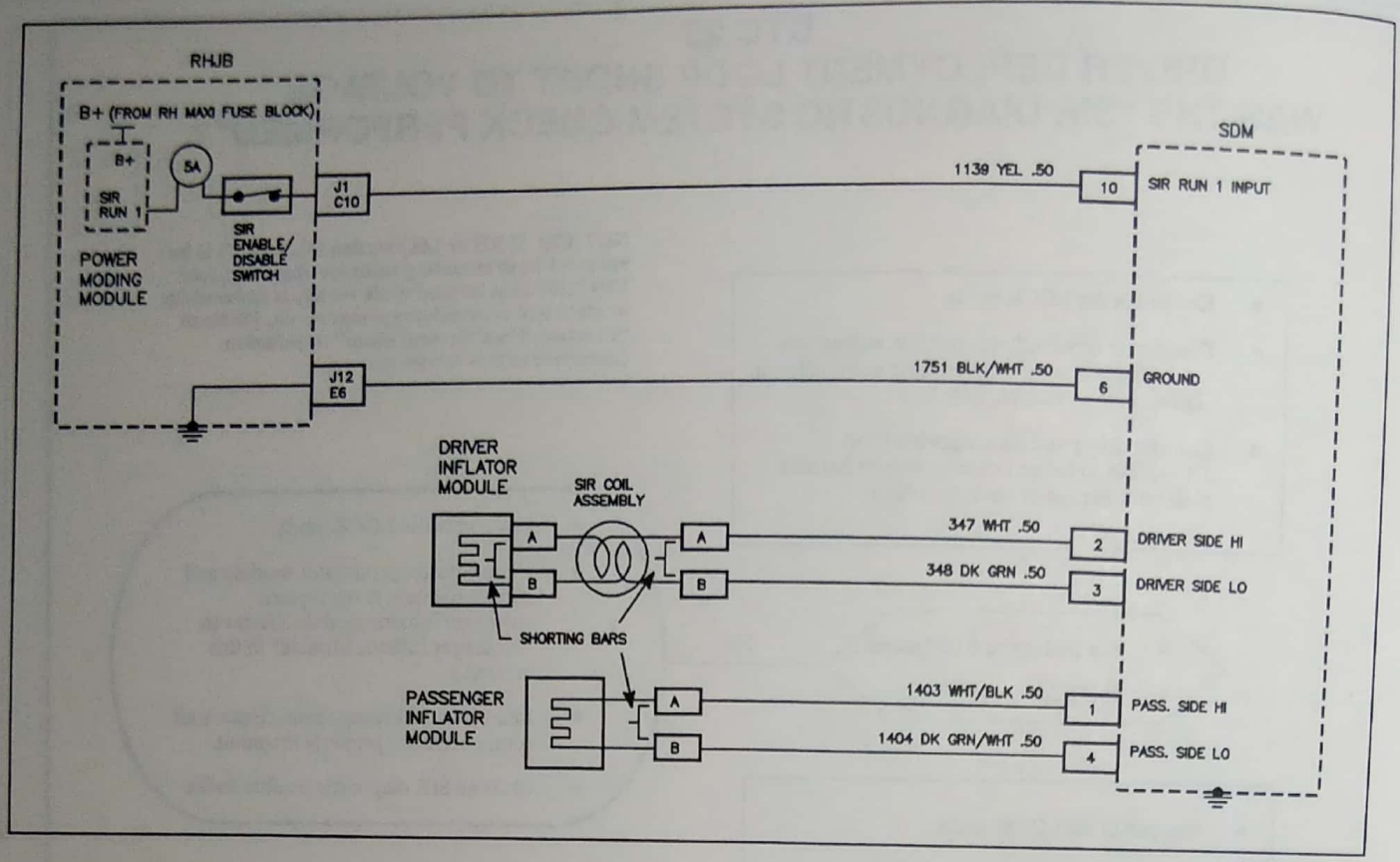

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DTC 26

DRIVER DEPLOYMENT LOOP OPEN

CIRCUIT DESCRIPTION

When the key pad is placed in the RUN mode the SDM will perform tests to diagnose critical malfunctions within itself. Upon passing these tests "RUN 1," VLR and deployment loop voltages are measured to ensure they are within their respective normal voltage ranges. The SDM then proceeds with the "Current Source Diagnostics." "Driver Side LO" cavity "3" is grounded through a resistor and the driver current source connected to "Driver Side HI" cavity "2" allows a known amount of current to flow. After "Current Source Diagnostics" are completed the SDM removes the low resistance ground from "Driver Side LO" and switches the driver current source at "Driver Side HI." The SDM then measures the voltage at "Driver Side HI" and "Driver Side LO"during "Continuous Monitoring." By monitoring the voltage difference between "Driver Side HI" and "Driver Side LO" the SDM calculates the combined resistance of the SIR coil assembly, driver inflator module, harness wiring circuits 347 and 348 and connector terminal contact.

DTC WILL SET WHEN:

The combined resistance of the SIR coil assembly, driver inflator module, harness wiring circuits 347 and 348 and connector terminal contact is greater than 500 ohms for 500 milliseconds during "Current Source Diagnostic" or "Continuous Monitoring."

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 26. DTC 26 will take precedence over DTCs 15, 16, 18, 21, 22 and 24.

DTC WILL CLEAR WHEN:

The voltage difference between "Driver Side HI" cavity "2" and "Driver Side LO" cavity "3" is less than 100 ohms for 500 milliseconds during "Continuous Monitoring."

DIAGNOSTIC AIDS:

An intermittent condition is likely to be caused by a poor connection at the driver inflator module terminals A and B, SIR coil assembly cavity A and B, SDM cavities "2" and "3" or an open in circuit 347 or 348.

When measurements are requested in this chart, use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittents and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, PLACE KEY PAD IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

DTC 26
DRIVER DEPLOYMENT LOOP OPEN
WAS THE "SIR DIAGNOSTIC SYSTEM CHECK PERFORMED"?

- Key pad in the LOCK mode.
- Disconnect driver and passenger inflator modules yellow two-way connectors located at base of steering column and under right side of I/P.
- Connect SA9409Z-A SIR driver/passenger load tool to driver and passenger inflator modules harness connectors.

- Key pad in the RUN mode.
- Is DTC 26 still current?

No

Yes

- Key pad in the LOCK mode.
- Disconnect SIR driver/passenger load tool.
- Disconnect SDM.
- Check continuity on SDM harness connector from cavity "2" to driver inflator module harness connector cavity "A" at base of steering column.

Is resistance one ohm or less?

No

Yes

- Measure resistance from SDM harness connector cavity "3" to driver inflator module harness connector cavity "B" at base of steering column.

Is resistance one ohm or less?

Yes

No

- Refer to Chart A. "SDM integrity check."

- Key pad in the LOCK mode.
- Repair high resistance in circuit 1403.
- Reconnect SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system.

- Key pad in the LOCK mode.
- Disconnect SIR driver/passenger load tool from driver inflator module harness connector.
- Reconnect driver inflator module yellow two-way connector at base of steering.
- Remove driver inflator module from steering wheel. (Refer to "Driver Inflator Module" in this manual.)
- Connect driver/passenger load tool to driver inflator module connector on SIR coil assembly.

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)

- Key pad in the RUN mode.
- Is DTC 26 still current?

No

Yes

- Check for poor connection at inflator module, if ok replace passenger inflator module. (Refer to "Driver Inflator Module" in this manual.)
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system.

- Check for poor connection, if ok replace SIR coil assembly. (Refer to "SIR Coil Assembly" in this manual.)
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system.

- Check for poor connection, if ok repair high resistance or open in circuit 347.
- Reconnect all SIR components. Ensure all components are properly mounted.
- Clear SIR diagnostic trouble codes.
- Repeat diagnostic system.

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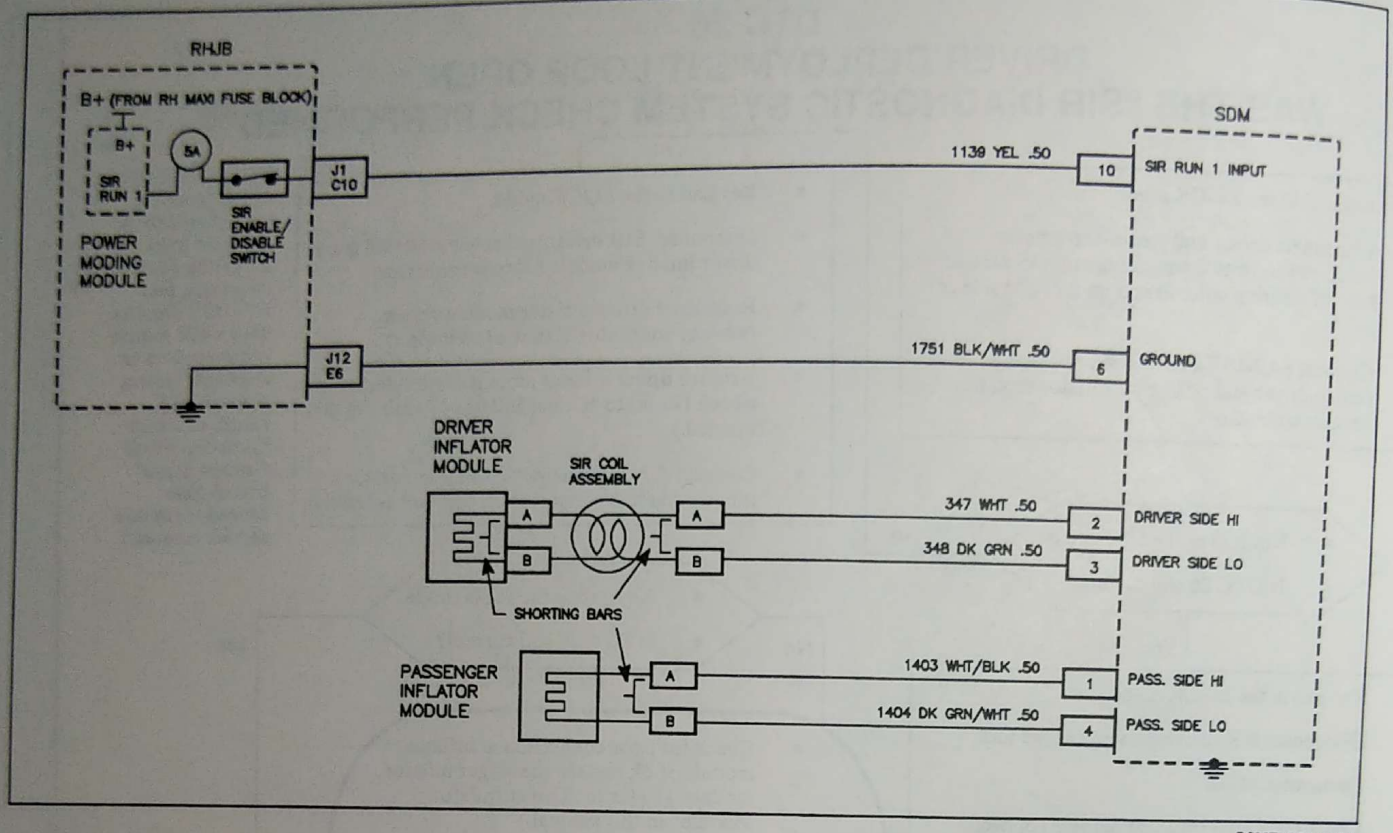

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DTC 51

DEPLOYMENT COMMANDED

CIRCUIT DESCRIPTION

The SDM contains a sensing device which converts vehicle velocity changes to an electrical signal. The electrical signal generated is processed by the SDM and then compared to a value stored in memory. When the generated signal exceeds the stored value additional signal processing is performed and the generated signals are compared to signals stored in memory. When two of the generated signals exceed the stored values or when one of the generated signals exceeds the stored value and the internal SDM sensor closes, the SDM will cause current to flow through the inflator modules deploying the air bags and causing DTC 51 to set.

DTC WILL SET WHEN:

The SDM detects a frontal crash, up to 30 degrees off the centerline of the vehicle, of sufficient force to warrant deployment of the air bags.

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp, records "Crash Data" and sets DTC 51.

DTC WILL CLEAR WHEN:

The SDM is replaced, DTC 51 will remain active and history, regardless if the key pad is placed in the LOCK mode or a PDT "Clear Codes" command is issued. The SDM must be replaced.

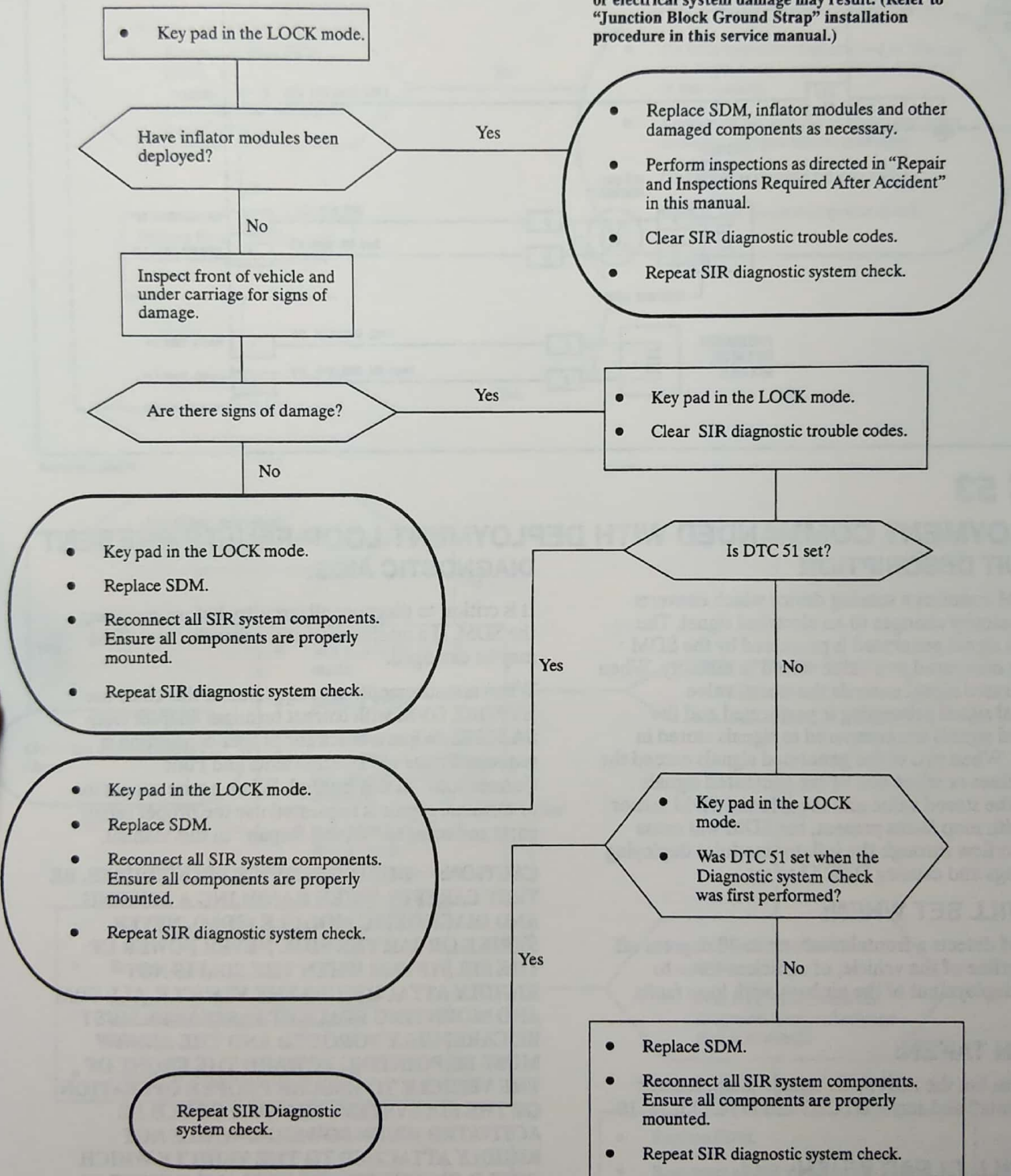
When measurements are requested in this chart use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittents and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

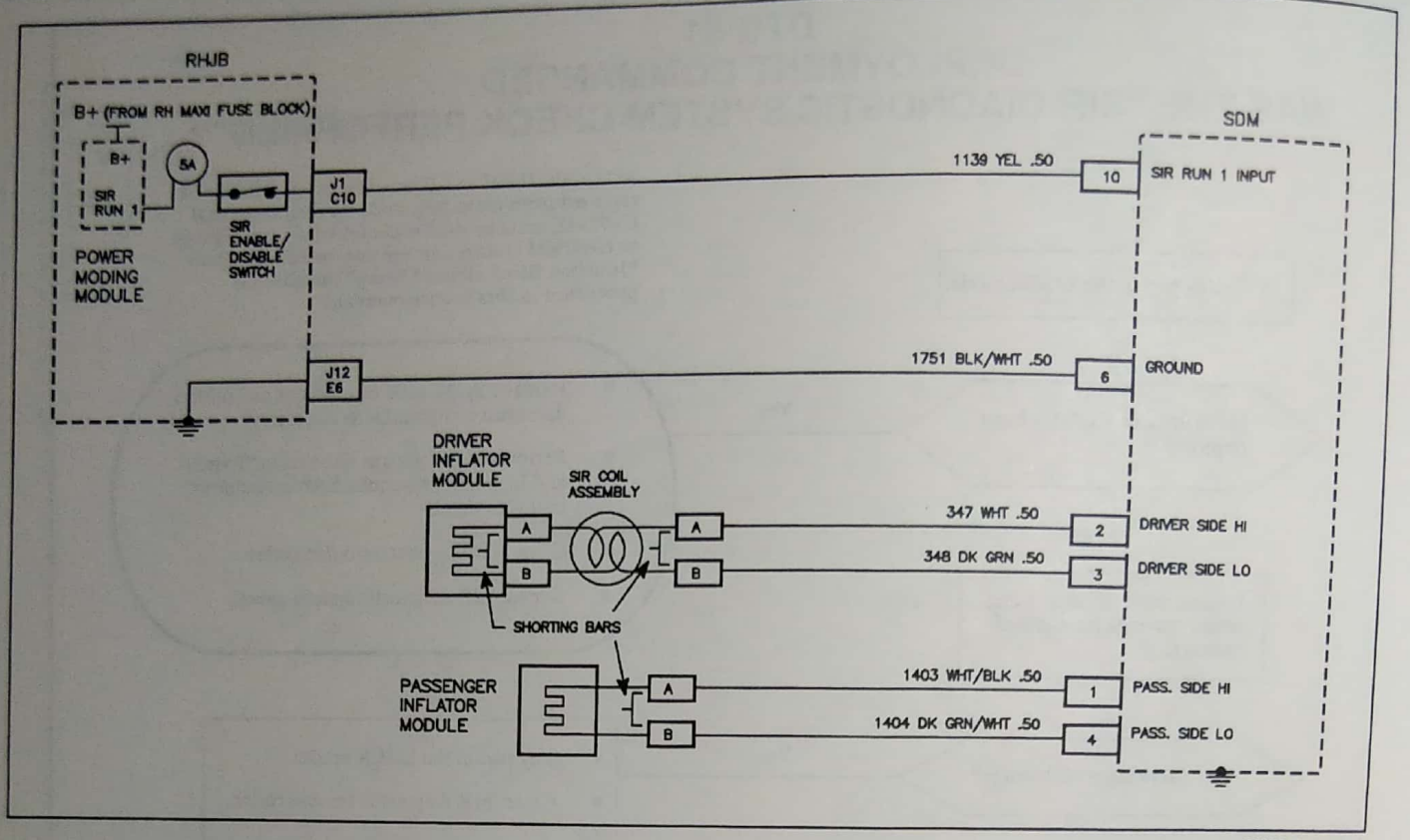
CAUTION: DURING SERVICE PROCEDURES, BE VERY CAREFUL WHEN HANDLING A SENSING AND DIAGNOSTIC MODULE (SDM). NEVER STRIKE OR JAR THE SDM. NEVER POWER UP THE SIR SYSTEM WHEN THE SDM IS NOT RIGIDLY ATTACHED TO THE VEHICLE. ALL SDM AND MOUNTING BRACKET FASTENERS MUST BE CAREFULLY TORQUED AND THE ARROW MUST BE POINTING TOWARD THE FRONT OF THE VEHICLE TO ENSURE PROPER OPERATION OF THE SIR SYSTEM. THE SDM COULD BE ACTIVATED WHEN POWERED WHILE NOT RIGIDLY ATTACHED TO THE VEHICLE WHICH COULD CAUSE DEPLOYMENT AND RESULT IN PERSONAL INJURY.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, PLACE THE KEY PAD IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

DTC 51
DEPLOYMENT COMMANDED
WAS THE "SIR DIAGNOSTIC SYSTEM CHECK PERFORMED"?

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)


Key pad in the LOCK mode.
Have inflator modules been deployed?
Yes
Replace SDM, inflator modules and other damaged components as necessary.
Perform inspections as directed in "Repair and Inspections Required After Accident" in this manual.
Clear SIR diagnostic trouble codes.
Repeat SIR diagnostic system check.
No
Inspect front of vehicle and under carriage for signs of damage.
Are there signs of damage?
Yes
Key pad in the LOCK mode.
Clear SIR diagnostic trouble codes.
No
Key pad in the LOCK mode.
Replace SDM.
Reconnect all SIR system components. Ensure all components are properly mounted.
Repeat SIR diagnostic system check.
Is DTC 51 set?
Yes
No
Key pad in the LOCK mode.
Replace SDM.
Reconnect all SIR system components. Ensure all components are properly mounted.
Repeat SIR diagnostic system check.
Key pad in the LOCK mode.
Was DTC 51 set when the Diagnostic system Check was first performed?
Yes
No
Repeat SIR Diagnostic system check.
Replace SDM.
Reconnect all SIR system components. Ensure all components are properly mounted.
Repeat SIR diagnostic system check.



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DTC 53

DEPLOYMENT COMMANDED WITH DEPLOYMENT LOOP FAULTS PRESENT

CIRCUIT DESCRIPTION

The SDM contains a sensing device which converts vehicle velocity changes to an electrical signal. The electrical signal generated is processed by the SDM and then compared to a value stored in memory. When the generated signal exceeds the stored value additional signal processing is performed and the generated signals are compared to signals stored in memory. When two of the generated signals exceed the stored values or when one of the generated signals exceeds the stored value and the internal SDM sensor closes, with loop faults present, the SDM will cause current to flow through the inflator modules deploying the air bags and causing DTC 53 to set.

DTC WILL SET WHEN:

The SDM detects a frontal crash, up to 30 degrees off the centerline of the vehicle, of sufficient force to warrant deployment of the air bags, with loop faults present.

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp, records "Crash Data" and sets a DTC 53 and DTCs 15, 21, 19 or 25.

DTC WILL CLEAR WHEN:

The SDM is replaced, DTC 53 will remain active and history, regardless if the key pad is placed in the LOCK mode, or a PDT "Clear Codes" command is issued. The SDM must be replaced.

DIAGNOSTIC AIDS:

It is critical to diagnose all circuitry before replacing the SDM. If a malfunction still exists the new SDM may be damaged.

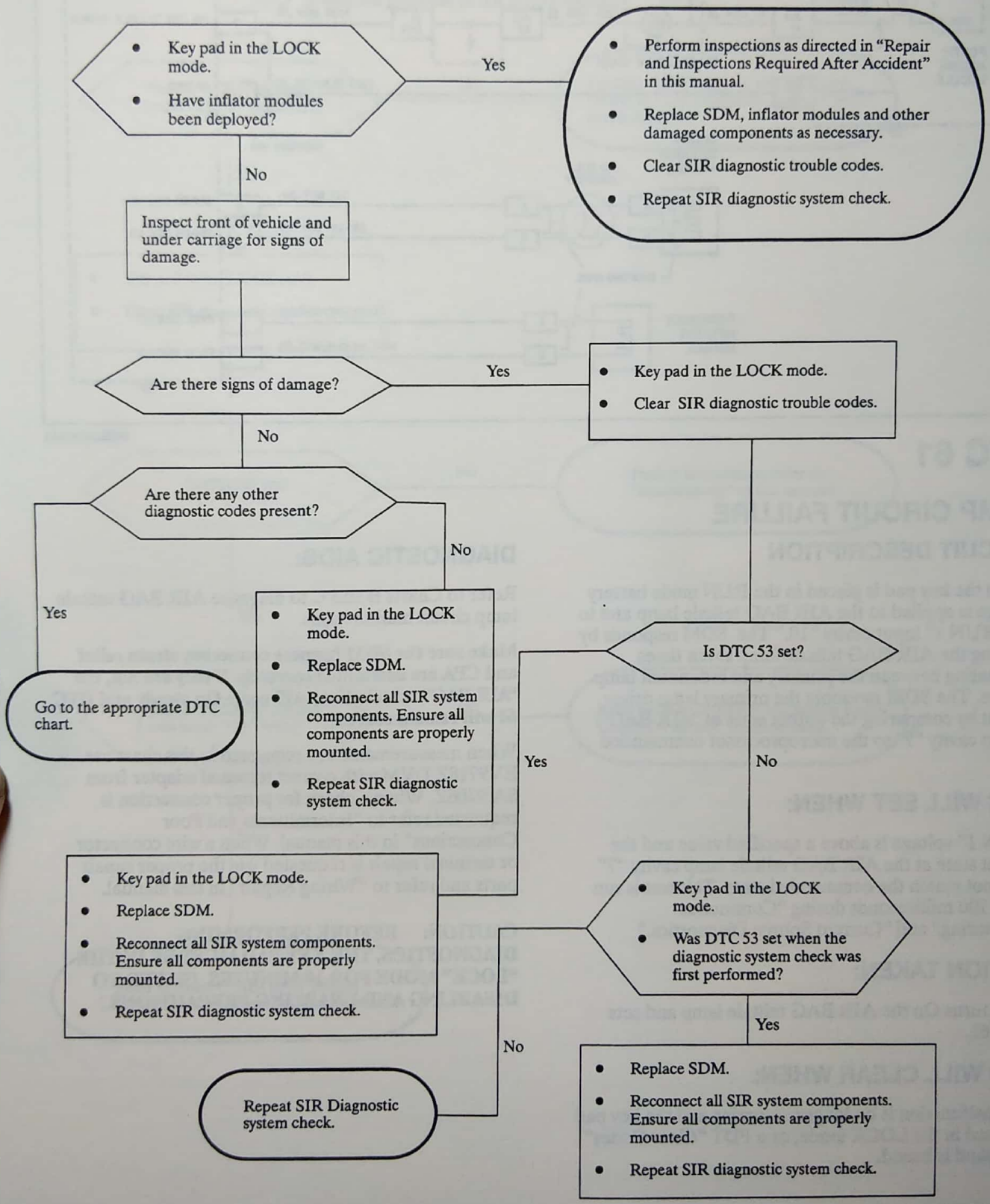
When measurements are requested in this chart use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittents and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

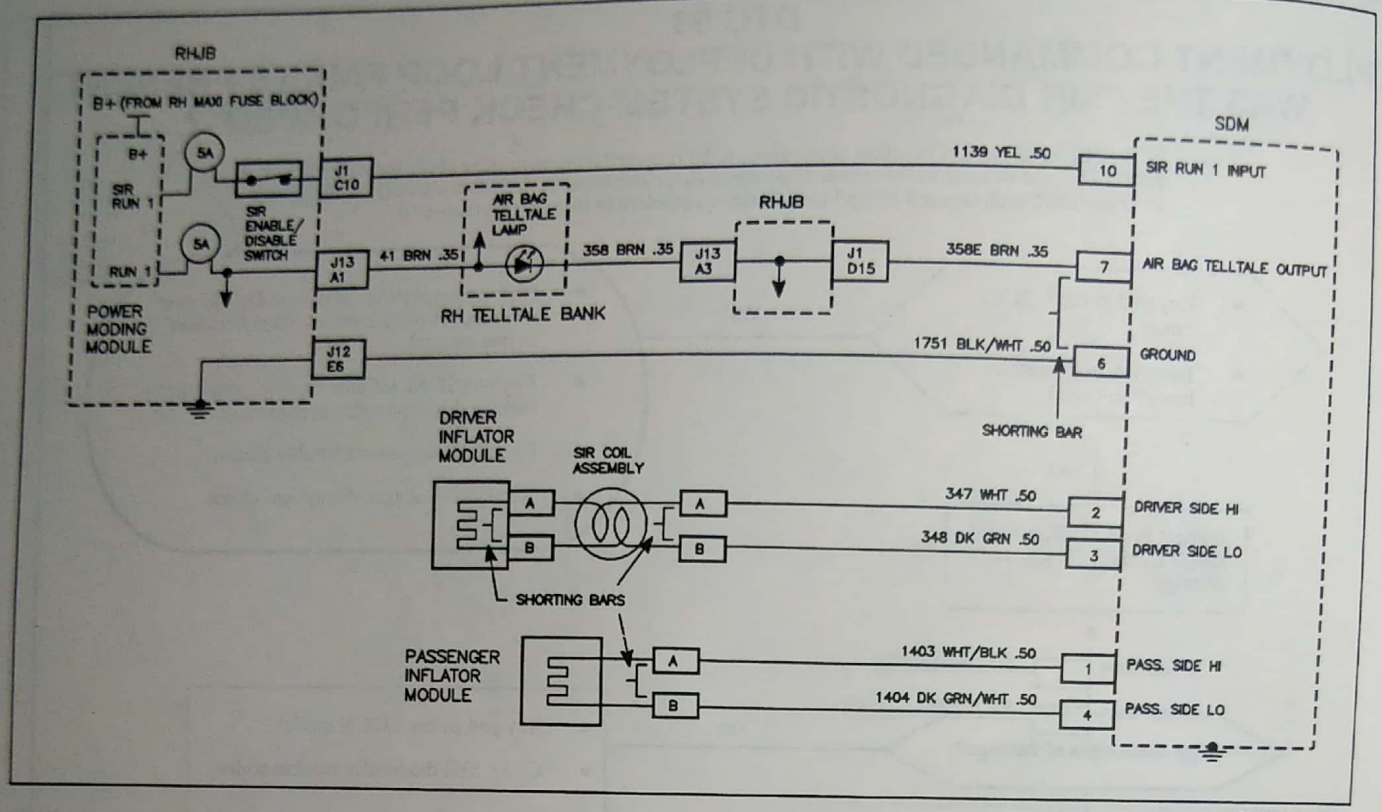
CAUTION: DURING SERVICE PROCEDURES, BE VERY CAREFUL WHEN HANDLING A SENSING AND DIAGNOSTIC MODULE (SDM). NEVER STRIKE OR JAR THE SDM. NEVER POWER UP THE SIR SYSTEM WHEN THE SDM IS NOT RIGIDLY ATTACHED TO THE VEHICLE. ALL SDM AND MOUNTING BRACKET FASTENERS MUST BE CAREFULLY TORQUED AND THE ARROW MUST BE POINTING TOWARD THE FRONT OF THE VEHICLE TO ENSURE PROPER OPERATION OF THE SIR SYSTEM. THE SDM COULD BE ACTIVATED WHEN POWERED WHILE NOT RIGIDLY ATTACHED TO THE VEHICLE WHICH COULD CAUSE DEPLOYMENT AND RESULT IN PERSONAL INJURY.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, PLACE THE KEY PAD IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

DTC 53
DEPLOYMENT COMMANDED WITH DEPLOYMENT LOOP FAULTS PRESENT WAS THE "SIR DIAGNOSTIC SYSTEM CHECK PERFORMED"?

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)


Key pad in the LOCK mode.
Have inflator modules been deployed?
Yes
Perform inspections as directed in "Repair and Inspections Required After Accident" in this manual.
Replace SDM, inflator modules and other damaged components as necessary.
Clear SIR diagnostic trouble codes.
Repeat SIR diagnostic system check.
No
Inspect front of vehicle and under carriage for signs of damage.
Are there signs of damage?
Yes
Key pad in the LOCK mode.
Clear SIR diagnostic trouble codes.
No
Are there any other diagnostic codes present?
No
Yes
Go to the appropriate DTC chart.
Key pad in the LOCK mode.
Replace SDM.
Reconnect all SIR system components. Ensure all components are properly mounted.
Repeat SIR diagnostic system check.
Is DTC 53 set?
Yes
No
Key pad in the LOCK mode.
Replace SDM.
Reconnect all SIR system components. Ensure all components are properly mounted.
Repeat SIR diagnostic system check.
Key pad in the LOCK mode.
Was DTC 53 set when the diagnostic system check was first performed?
No
Yes
Repeat SIR Diagnostic system check.
Replace SDM.
Reconnect all SIR system components. Ensure all components are properly mounted.
Repeat SIR diagnostic system check.



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DTC 61

LAMP CIRCUIT FAILURE

CIRCUIT DESCRIPTION

When the key pad is placed in the RUN mode battery voltage is applied to the AIR BAG telltale lamp and to the "RUN 1" input cavity "10." The SDM responds by flashing the AIR BAG telltale lamp seven times alternating between the primary and redundant lamp drivers. The SDM monitors the primary lamp driver output by comparing the output state at "AIR BAG" output cavity "7" to the microprocessor commanded state.

DTC WILL SET WHEN:

"RUN 1" voltage is above a specified value and the output state at the AIR BAG telltale lamp cavity "7" does not match the commanded state. This test is run every 100 milliseconds during "Continuous Monitoring" and "Current Source Diagnostics."

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 61.

DTC WILL CLEAR WHEN:

The malfunction is no longer occurring and the key pad is placed in the LOCK mode, or a PDT "Clear Codes" command is issued.

DIAGNOSTIC AIDS:

Refer to Charts B and C to diagnose AIR BAG telltale lamp circuit malfunctions.

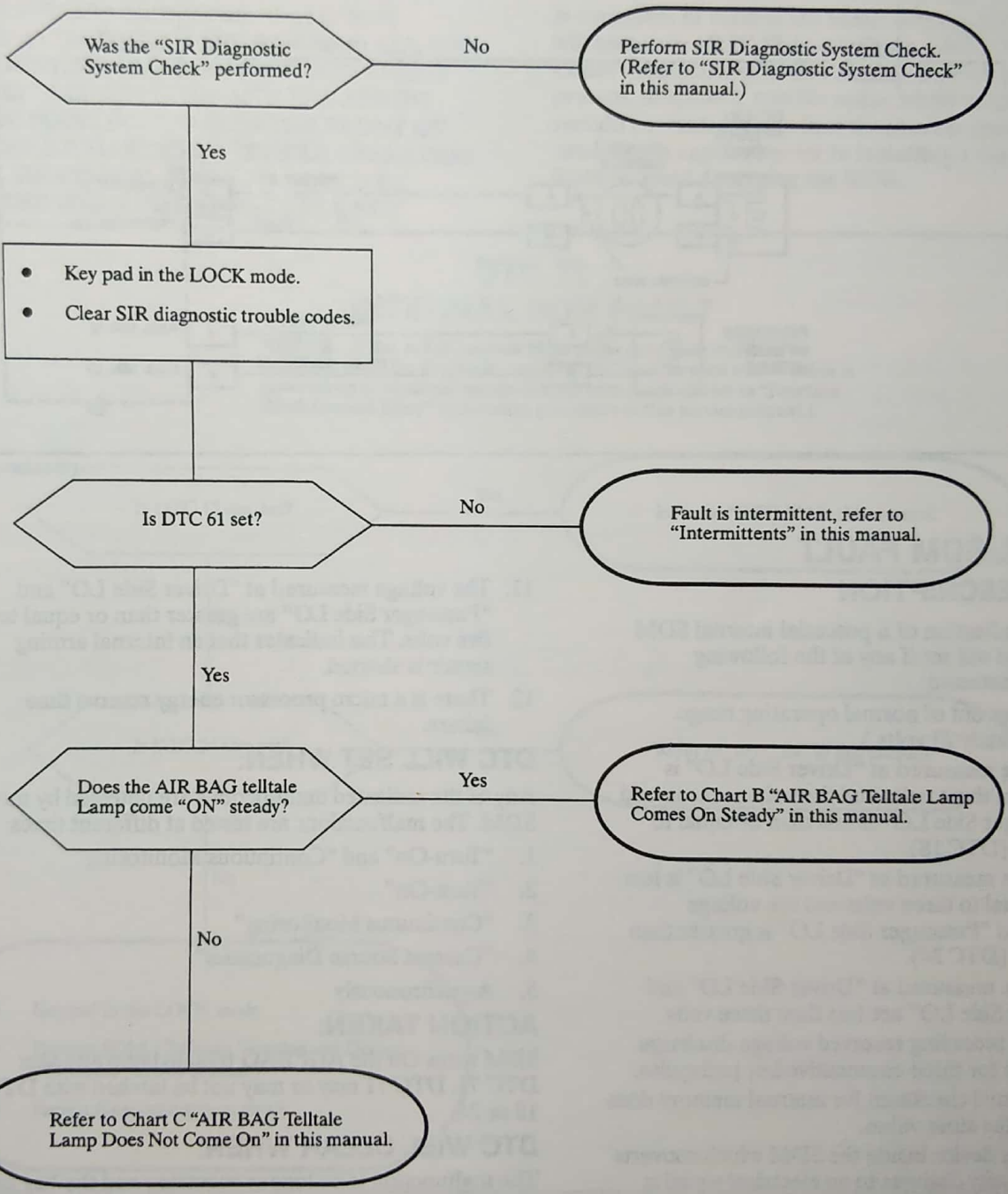
Make sure the SDM harness connector, strain relief and CPA are assembled correctly. If they are not, the "AIR BAG" telltale lamp will come On steady and DTC 61 will remain current.

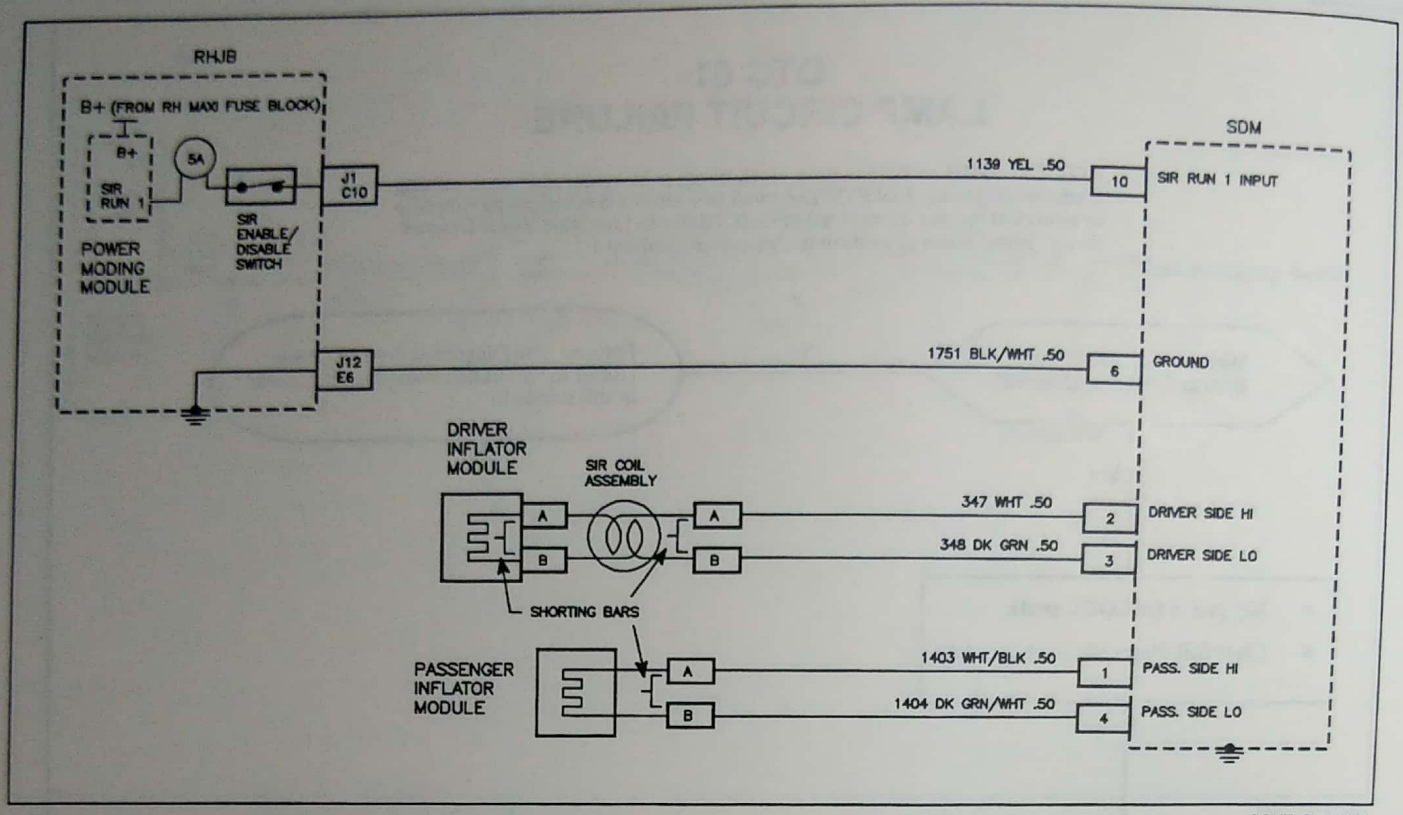
When measurements are requested in this chart use EV9718Z DVM with correct terminal adapter from SA 9206Z. When a check for proper connection is requested refer to "Intermittents and Poor Connections" in this manual. When a wire connector or terminal repair is requested use the proper repair parts and refer to "Wiring Repair" in this manual.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

DTC 61
LAMP CIRCUIT FAILURE

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)


Was the "SIR Diagnostic System Check" performed?
No
Perform SIR Diagnostic System Check. (Refer to "SIR Diagnostic System Check" in this manual.)
Yes
Key pad in the LOCK mode.
Clear SIR diagnostic trouble codes.
Is DTC 61 set?
No
Fault is intermittent, refer to "Intermittents" in this manual.
Yes
Does the AIR BAG telltale Lamp come "ON" steady?
Yes
Refer to Chart B "AIR BAG Telltale Lamp Comes On Steady" in this manual.
No
Refer to Chart C "AIR BAG Telltale Lamp Does Not Come On" in this manual.



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DTC 71

INTERNAL SDM FAULT

CIRCUIT DESCRIPTION

DTC 71 is an indication of a potential internal SDM malfunction and will set if any of the following conditions are detected:

1. VLR voltage out of normal operating range. (Approximately 23 volts.)
2. The voltage measured at "Driver Side LO" is greater than three volts and the voltage measured at "Passenger Side LO" is less than or equal to three volts (DTC 18).
3. The voltage measured at "Driver Side LO" is less than or equal to three volts and the voltage measured at "Passenger Side LO" is greater than three volts (DTC 24).
4. The voltage measured at "Driver Side LO" and "Passenger Side LO" are less than three volts.
5. Crash data recording reserved voltage discharge time failure for three consecutive key pad cycles.
6. The calculated checksum for internal memory does not match the store value.
7. The sensing device inside the SDM which converts vehicle velocity changes to an electrical signal is malfunctioning.
8. The driver current source and/or passenger current source is malfunctioning.
9. The temporary memory storage area is malfunctioning.
10. SDM is unable to read from or write to EEPROM.
11. The voltage measured at "Driver Side LO" and "Passenger Side LO" are greater than or equal to five volts. This indicates that an internal arming sensor is shorted.
12. There is a micro processor energy reserve time failure.

DTC WILL SET WHEN:

Any of the indicated malfunctions are detected by the SDM. The malfunctions are tested at different times:

1. "Turn-On" and "Continuous Monitoring"
2. "Turn-On"
3. "Continuous Monitoring"
4. "Current Source Diagnostics"
5. Asynchronously

ACTION TAKEN:

SDM turns On the AIR BAG telltale lamp and sets DTC 71. DTC 71 may or may not be latched with DTC 18 or 24.

DTC WILL CLEAR WHEN:

The malfunction is no longer occurring and the key pad is placed in the LOCK mode or a PDT "Clear Codes" command is issued. Some of the indicated malfunctions will only allow the AIR BAG telltale lamp to go out briefly then come back On. The SDM must be replaced.

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DIAGNOSTIC AIDS:

When DTC 71 is latched with DTC 18 or 24 it is critical to diagnose those DTCs before replacing the SDM. If DTC 71 returns after the SDM has been replaced make sure that "Driver Side LO" and "Passenger Side LO" are not less than three volts.

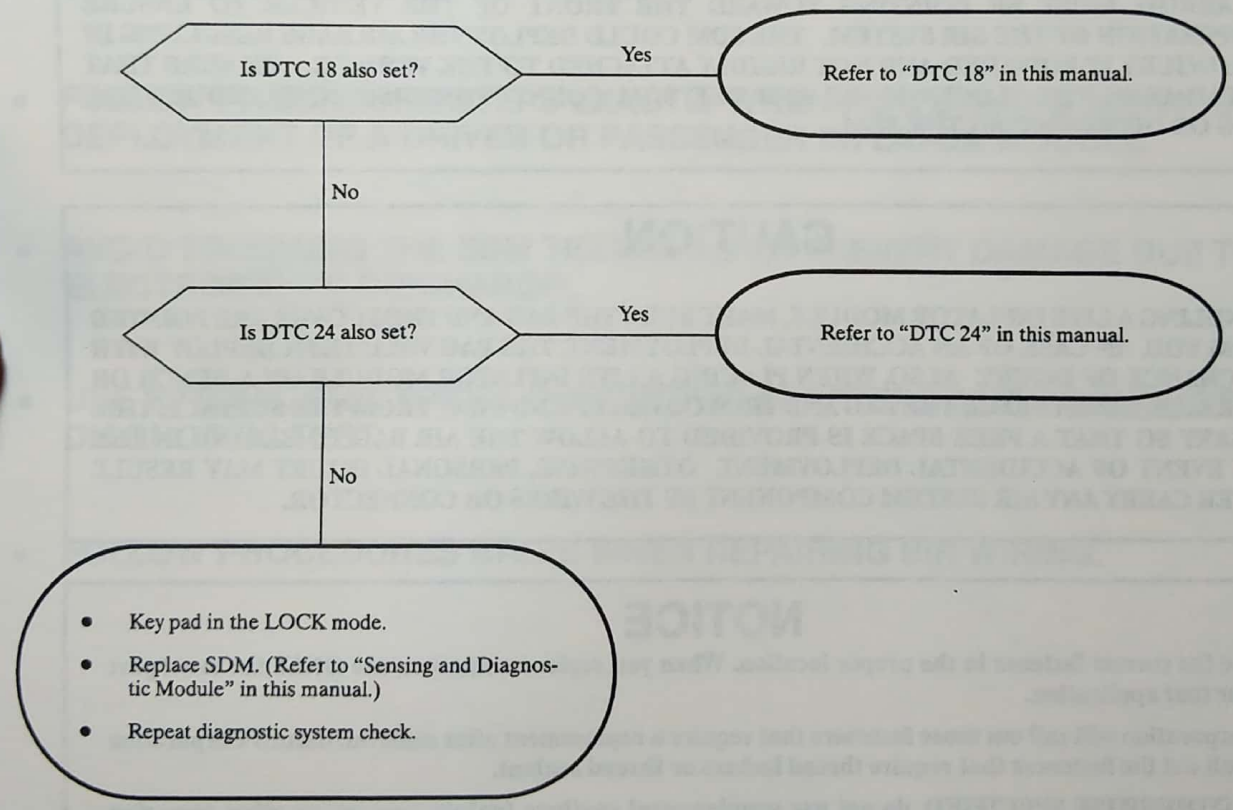
CAUTION: DURING SERVICE PROCEDURES, BE VERY CAREFUL WHEN HANDLING A SENSING AND DIAGNOSTIC MODULE (SDM). NEVER STRIKE OR JAR THE SDM. NEVER POWER UP THE SIR SYSTEM WHEN THE SDM IS NOT RIGIDLY ATTACHED TO THE VEHICLE. ALL SDM AND MOUNTING BRACKET FASTENERS MUST BE CAREFULLY TORQUED AND THE ARROW MUST BE POINTING TOWARD THE FRONT OF THE VEHICLE TO ENSURE PROPER OPERATION OF THE SIR SYSTEM. THE SDM COULD BE ACTIVATED WHEN POWERED WHILE NOT RIGIDLY ATTACHED TO THE VEHICLE WHICH COULD CAUSE DEPLOYMENT AND RESULT IN PERSONAL INJURY.

CAUTION: BEFORE PERFORMING DIAGNOSTICS, THE KEY PAD MUST BE IN THE "LOCK" MODE FOR 10 MINUTES. (REFER TO DISABLING AND ENABLING PRECAUTIONS.)

NOTICE: When DTC 18 or DTC 24 has been set, it is necessary to replace the SDM. Setting DTC 18 or 24 will also cause DTC 71 to set. When a PDT "Clear Codes" command is issued and the malfunction is still present, diagnostic trouble codes 18, 24 and 71 will remain current. Ensure that the short to ground condition is repaired prior to installing a replacement SDM to avoid damaging the SDM.

DTC 71
INTERNAL SDM FAULT

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to "Junction Block Ground Strap" installation procedure in this service manual.)


Is DTC 18 also set?
Yes
Refer to "DTC 18" in this manual.
No
Is DTC 24 also set?
Yes
Refer to "DTC 24" in this manual.
No
• Key pad in the LOCK mode.
• Replace SDM. (Refer to "Sensing and Diagnostic Module" in this manual.)
• Repeat diagnostic system check.

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SERVICE

SIR SYSTEM SERVICE PRECAUTIONS

When servicing the SIR system observe the following precautions:

CAUTION

PROPER OPERATION OF THE SIR SYSTEM REQUIRES THAT ANY REPAIRS TO THE VEHICLE STRUCTURE MUST BE RETURNED TO ITS ORIGINAL PRODUCTION CONFIGURATION. DEPLOYMENT (CURRENT DTC 51) OR ANY VISIBLE DAMAGE TO THE SIR SYSTEM REQUIRES REPLACEMENT, NOT REPAIR. FAILURE TO OBSERVE THESE PRECAUTIONS CAN RESULT IN IMPROPER SIR SYSTEM OPERATION AND POSSIBLE LACK OF SUPPLEMENTAL RESTRAINT PROTECTION FOR THE DRIVER AND PASSENGER DURING AN ACCIDENT IMPACT.

CAUTION

BE CAREFUL WHEN HANDLING THE SENSING AND DIAGNOSTIC MODULE (SDM). NEVER STRIKE OR JAR THE SDM. NEVER POWER UP THE SIR SYSTEM WHEN THE SDM IS NOT RIGIDLY ATTACHED TO THE VEHICLE. ALL SDM AND MOUNTING BRACKET FASTENERS MUST BE CAREFULLY TORQUED AND THE ARROW MUST BE POINTING TOWARD THE FRONT OF THE VEHICLE TO ENSURE PROPER OPERATION OF THE SIR SYSTEM. THE SDM COULD DEPLOY THE AIR BAGS RESULTING IN PERSONAL INJURY IF POWERED AND NOT RIGIDLY ATTACHED TO THE VEHICLE. BE SURE THAT THE KEY PAD IS IN THE "LOCK" MODE AND THE SDM CONNECTOR DISCONNECTED BEFORE MOUNTING OR DISMOUNTING THE SDM.

CAUTION

WHEN HANDLING A LIVE INFLATOR MODULE, MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. IN CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG WILL THEN DEPLOY WITH MINIMAL CHANCE OF INJURY. ALSO, WHEN PLACING A LIVE INFLATOR MODULE ON A BENCH OR OTHER SURFACE, ALWAYS FACE THE BAG AND TRIM COVER UP AND AWAY FROM THE SURFACE. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE AIR BAG TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY MAY RESULT. ALSO, NEVER CARRY ANY SIR SYSTEM COMPONENT BY THE WIRES OR CONNECTOR.

NOTICE

Always use the correct fastener in the proper location. When you replace a fastener, use ONLY the exact part number for that application.

Saturn Corporation will call out those fasteners that require a replacement after removal. Saturn Corporation will also call out the fasteners that require thread lockers or thread sealant.

UNLESS OTHERWISE SPECIFIED, do not use supplemental coatings (paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and the joint clamping force, and may damage the fastener.

When you install fasteners, use the correct tightening sequence and specifications.

Following these instructions can help you avoid damage to parts and systems.

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SIR SYSTEM SERVICE PRECAUTIONS

- PERFORM THE SIR DIAGNOSTIC SYSTEM CHECK AS THE FIRST AND LAST TASK DURING DIAGNOSIS SERVICE.
- DISABLE THE SIR SYSTEM WHEN PERFORMING SERVICE WORK.
- INSPECT SIR SYSTEM COMPONENTS AFTER AN ACCIDENT THAT MAY OR MAY NOT INVOLVE BAG DEPLOYMENT.
- HANDLE AND STORE A DRIVER OR PASSENGER INFLATOR MODULE TO AVOID PERSONAL INJURY, ACCIDENTAL DEPLOYMENT OR DAMAGE.
- FOLLOW EXACT GUIDELINES WHEN SHIPPING AN UNDEPLOYED DRIVER OR PASSENGER INFLATOR MODULE.
- FOLLOW PROCEDURE STEPS EXACTLY WHEN PERFORMING SERVICE DEPLOYMENT OF A DRIVER OR PASSENGER INFLATOR MODULE.
- AVOID TOUCHING THE SDM TERMINALS TO PREVENT DAMAGE DUE TO ELECTROSTATIC DISCHARGE.
- USE SPECIAL ELECTRICAL CONNECTOR ADAPTERS WHEN CONDUCTING DIAGNOSTIC TEST.
- FOLLOW PROCEDURES STEPS WHEN REPAIRING SIR WIRING.

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SIR SYSTEM

ON VEHICLE SERVICE

SERVICE PRECAUTIONS

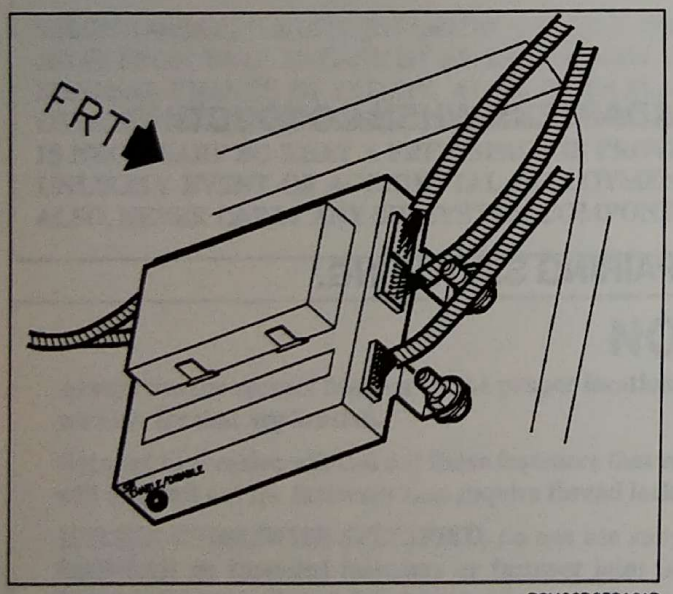
CAUTION: WHEN PERFORMING SERVICE ON OR AROUND SIR COMPONENTS OR SIR WIRING FOLLOW THE PROCEDURE BELOW TO TEMPORARILY DISABLE THE SIR SYSTEM. FAILURE TO FOLLOW PROCEDURES COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY OR OTHERWISE UNNEEDED SIR SYSTEM REPAIRS.

THE SENSING AND DIAGNOSTIC MODULE (SDM) CAN MAINTAIN SUFFICIENT VOLTAGE TO CAUSE A DEPLOYMENT FOR UP TO *10 MINUTES* AFTER THE KEY PAD HAS BEEN PLACED IN THE "LOCK" MODE, ALSO IF THE AUXILIARY BATTERY IS DISCONNECTED OR THE SIR "ENABLE/DISABLE" SWITCH IS PLACED IN THE DISABLE POSITION. MANY OF THE SERVICE PROCEDURES REQUIRE THE SIR "ENABLE/DISABLE" SWITCH TO BE PLACED IN THE "DISABLE" POSITION AND DISCONNECTION OF THE DEPLOYMENT LOOPS TO AVOID AN ACCIDENTAL DEPLOYMENT.

DISABLING THE SIR SYSTEM

1. Turn the steering wheel so that the vehicle's wheels are pointing straight ahead.
2. Place the key pad in the **LOCK** mode.
3. Place the SIR **"ENABLE/DISABLE"** switch in the right hand junction block in the **DISABLE** position.

IMPORTANT: With the SIR **ENABLE/DISABLE** switch in the **DISABLE** position and the key pad in the RUN mode, the AIR BAG telltale lamp will be "On." This is normal operation and does not indicate an SIR system malfunction.



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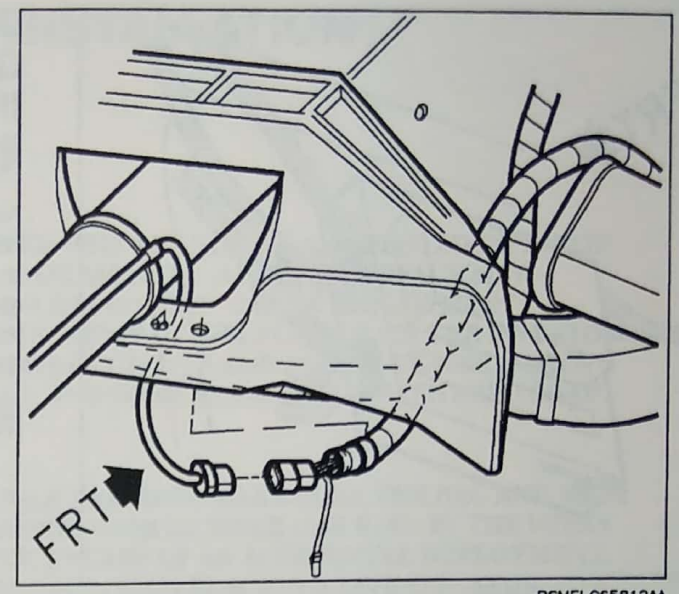
4. Remove connector position assurance (CPA) device and disconnect yellow two-way connector located near the base of the steering column.



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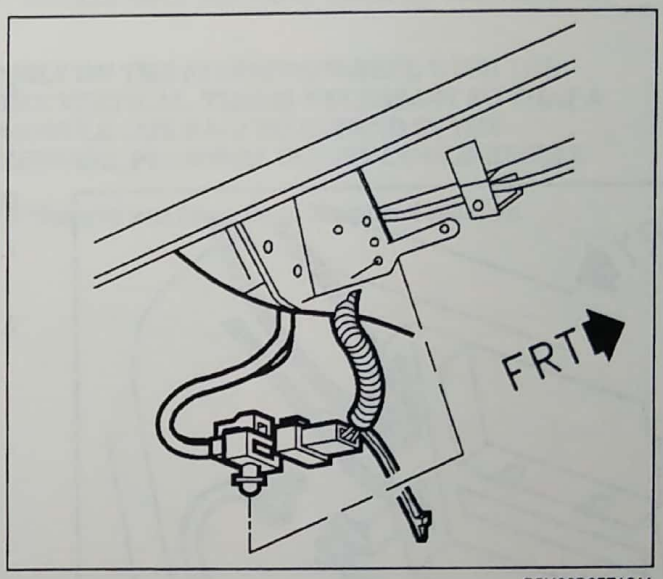
5. Remove connector position assurance (CPA) device and disconnect yellow two-way connector located on passenger inflator module pigtail under RH side of I/P.



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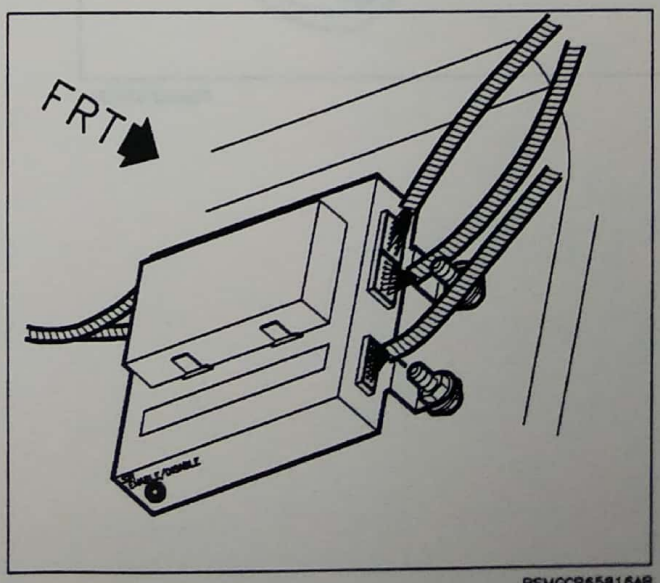
ENABLING THE SIR SYSTEM

1. Place key pad in the **LOCK** mode.
2. Connect yellow two-way SIR connector at the base of steering column and install connector position assurance (CPA) device to connector.
3. Connect yellow two-way passenger inflator module pigtail and install connector position assurance (CPA) to connector.
4. Place SIR **ENABLE/DISABLE** switch to the **ENABLE** position, located in the RH junction block.
5. Place key pad in the "RUN" mode and verify that the AIR BAG telltale lamp flashes seven times as the key pad is placed in the "RUN" mode and then goes Off. If lamp does not operate as described above perform the "SIR Diagnostic System Check" in this manual.



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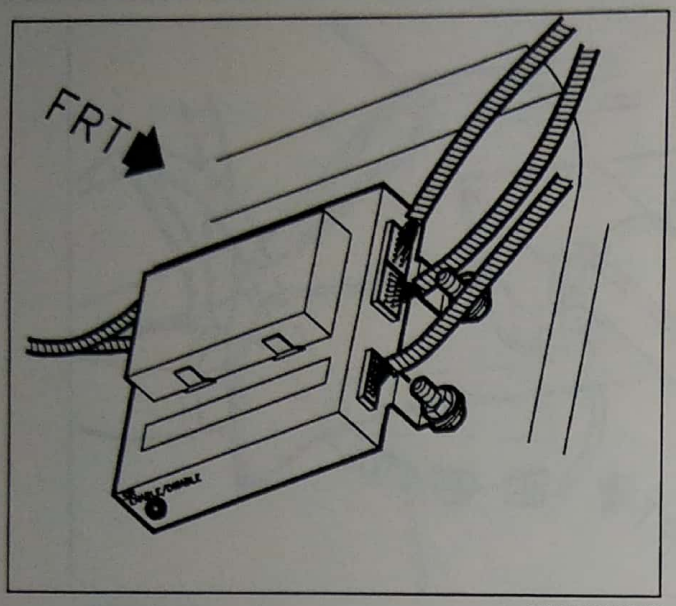

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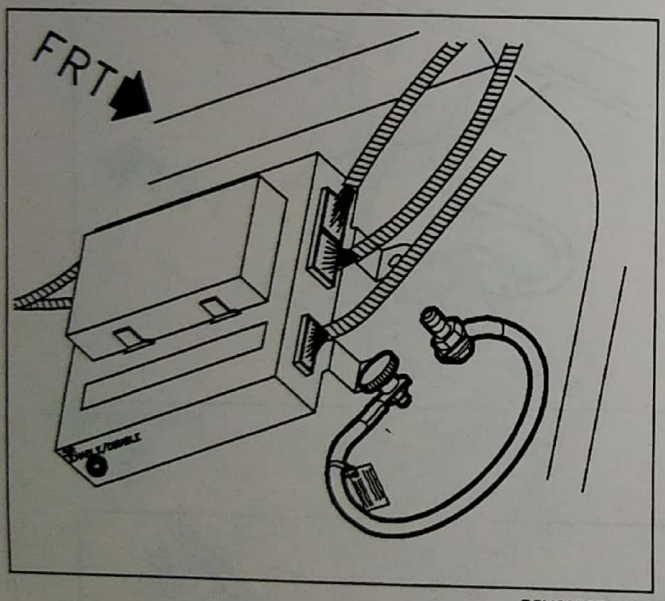
JUNCTION BLOCK GROUND STRAP INSTALLATION/REMOVAL PROCEDURE

NOTICE: If RH or LH junction block needs to be removed from mounting studs for diagnosis, tool EV 9713Z must be used while vehicle is powered-up or electrical system damage may result. (Refer to junction block ground strap installation procedure in this manual.)

INSTALLATION

1. Place key pad in LOCK mode.
2. Remove the four fasteners that retain the RH or LH junction block.
3. Install junction block ground strap/straps to junction block using the captured fasteners as illustrated and tighten to 10 N•m +/− 2 N•m.
4. Install the loose end of the junction block ground strap to the junction block mounting stud on front of dash, using the existing nut.



PSMGCP67427AA

REMOVAL

1. Remove the junction block ground strap from the junction block, RH and LH sides if necessary.
2. Mount the junction block to the front of dash and torque to 10 N•m +/− 2 N•m.

COMPONENT REMOVAL AND INSTALLATION PROCEDURES

DRIVER INFLATOR MODULE (AIR BAG)

NOTICE: SAFETY PRECAUTIONS MUST BE FOLLOWED WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG). AFTER DEPLOYMENT, THE INFLATOR MODULE (AIR BAG) SURFACE MAY CONTAIN A SMALL AMOUNT OF SODIUM HYDROXIDE, A BY-PRODUCT OF THE DEPLOYMENT REACTION, THAT IS IRRITATING TO THE SKIN AND EYES. MOST OF THE POWDER ON THE INFLATOR MODULE (AIR BAG) IS HARMLESS. AS A PRECAUTION, WEAR GLOVES AND SAFETY GLASSES WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG), AND WASH YOUR HANDS WITH MILD SOAP AND WATER AFTERWARDS.

NOTICE: WHEN CARRYING A LIVE INFLATOR MODULE (AIR BAG), MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. NEVER CARRY INFLATOR MODULE (AIR BAG) BY THE WIRES OR CONNECTOR ON THE UNDERSIDE OF THE MODULE. IN CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG WILL DEPLOY WITH MINIMAL CHANCE OF INJURY. WHEN PLACING A LIVE INFLATOR MODULE (AIR BAG) ON A BENCH OR OTHER SURFACE, ALWAYS FACE BAG AND TRIM COVER UP, AWAY FROM THE SURFACE.

NOTICE: NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE (AIR BAG) FACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE INFLATOR MODULE (AIR BAG) TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY COULD RESULT.

IMPORTANT: In the event deployment has occurred, refer to "Repairs and Inspections Required After an Accident" in this service manual.

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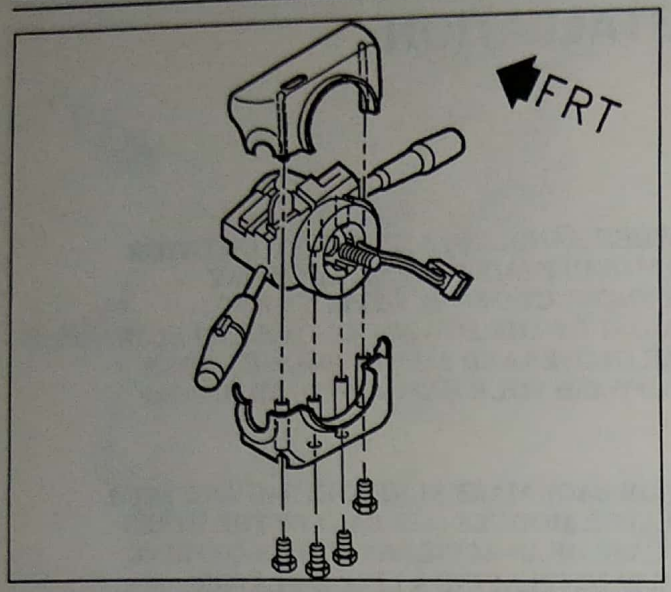
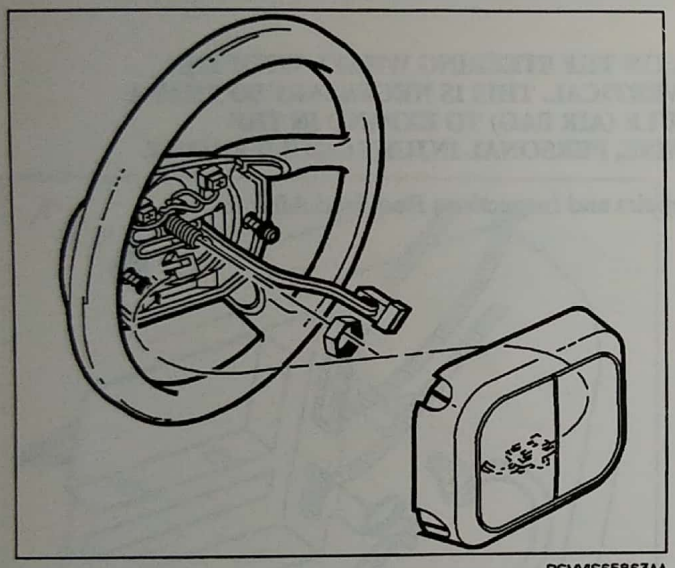


PSMVIS65827AA

DRIVERS SIDE SIR INFLATOR MODULE

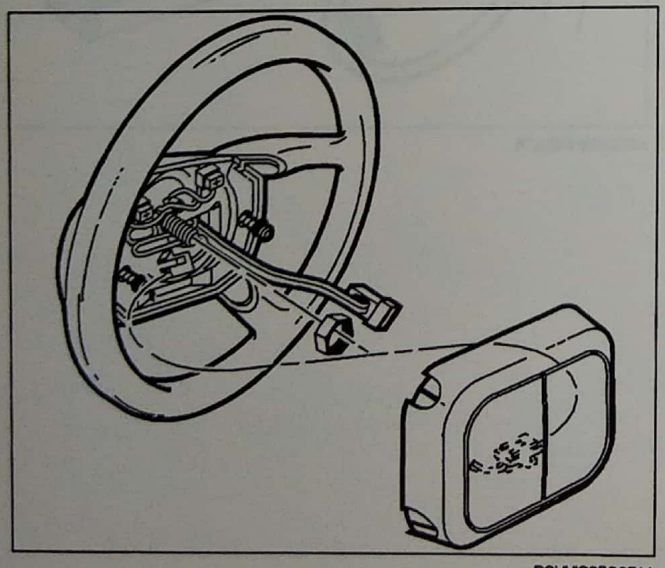
REMOVAL

1. Disable the SIR system. (Refer to "Disabling the SIR System" in this manual.)
2. Remove outer screws from lower steering column trim cover and lift upper trim panel off.
3. Remove inner screws from lower steering column trim cover to remove lower trim cover.



PSMVIS65863AA

4. Remove screws from back of steering wheel which retains the SIR inflator module.
5. Remove the connector position assurance (CPA) from inflator module connector and disconnect the connector. Remove SIR inflator module.



PSMVIS65863AA

INSTALLATION

1. Route yellow SIR inflator module wire harness within the steering wheel hub forming an "S" shape with wire.
2. Connect SIR inflator module connector and install CPA.
3. Install SIR inflator module to steering wheel.

Torque: 10 N•m (89 in–lbs)

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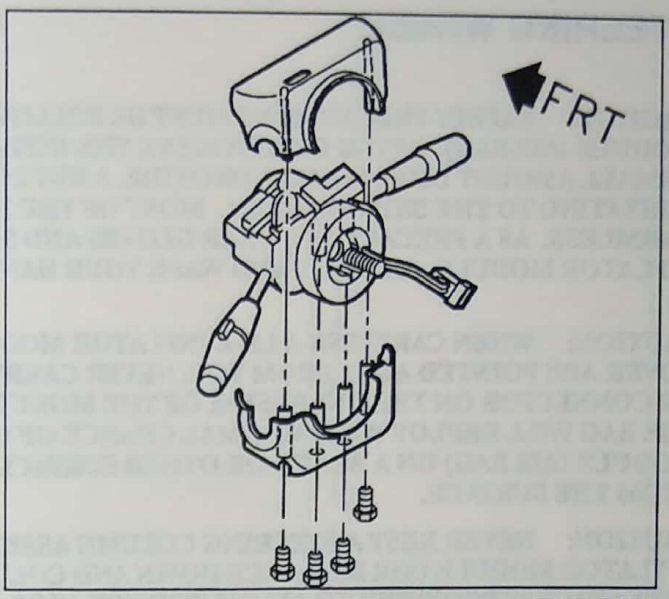
4. Align lower steering column trim cover to steering column and install inner screws.
5. Align upper steering column trim panel to steering column and install outer screws in lower steering column trim panel.
6. Enable the SIR system. (Refer to "Enabling the SIR system" in this manual.)



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STEERING WHEEL

CAUTION: SAFETY PRECAUTIONS MUST BE FOLLOWED WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG). AFTER DEPLOYMENT, THE INFLATOR MODULE (AIR BAG) SURFACE MAY CONTAIN A SMALL AMOUNT OF SODIUM HYDROXIDE, A BY-PRODUCT OF THE DEPLOYMENT REACTION, THAT IS IRRITATING TO THE SKIN AND EYES. MOST OF THE POWDER ON THE INFLATOR MODULE (AIR BAG) IS HARMLESS. AS A PRECAUTION, WEAR GLOVES AND SAFETY GLASSES WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG), AND WASH YOUR HANDS WITH MILD SOAP AND WATER AFTERWARDS.

CAUTION: WHEN CARRYING A LIVE INFLATOR MODULE (AIR BAG), MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. NEVER CARRY INFLATOR MODULE (AIR BAG) BY THE WIRES OR CONNECTOR ON THE UNDERSIDE OF THE MODULE. IN CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG WILL DEPLOY WITH MINIMAL CHANCE OF INJURY. WHEN PLACING A LIVE INFLATOR MODULE (AIR BAG) ON A BENCH OR OTHER SURFACE, ALWAYS FACE BAG AND TRIM COVER UP, AWAY FROM THE SURFACE.

CAUTION: NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE (AIR BAG) FACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE INFLATOR MODULE (AIR BAG) TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY COULD RESULT.

IMPORTANT: In the event deployment has occurred, refer to "Repairs and Inspections Required After an Accident" in this service manual.

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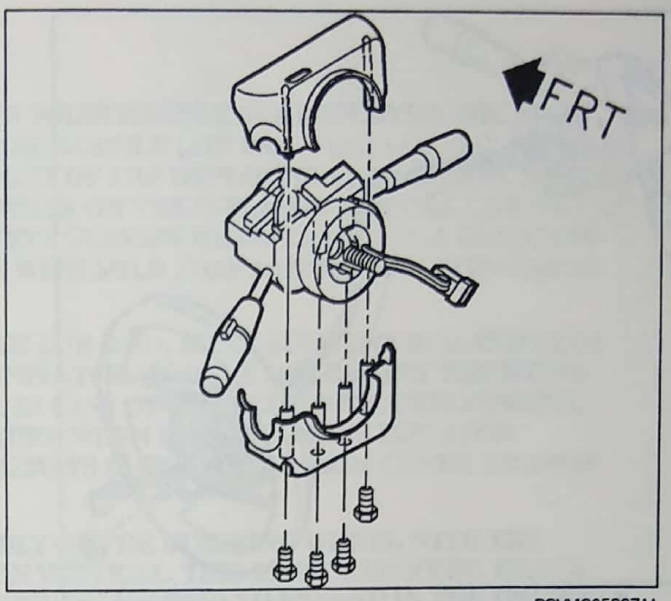
STEERING WHEEL

REMOVAL

1. Disable the SIR system. (Refer to "Disabling the SIR System" in this service manual.)
2. Remove outer screws from lower steering column trim cover and lift upper trim panel off.
3. Remove inner screws from lower steering column trim cover to remove lower trim cover.



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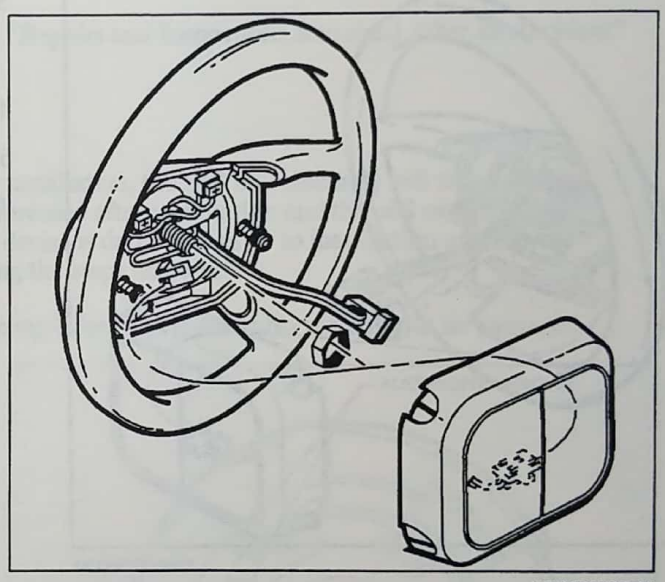
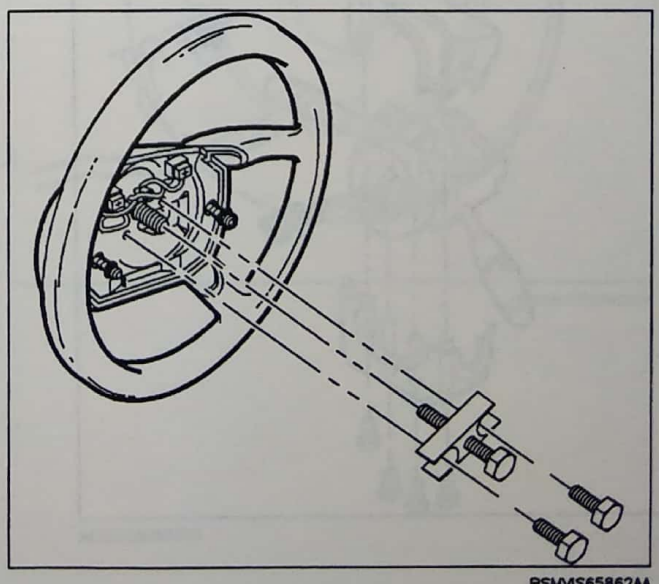
4. Remove screws from back of steering wheel that retains the SIR inflator module. Remove connector position assurance (CPA) from SIR inflator module connector and disconnect connector. Remove SIR inflator module.



PSMIS65863AA

5. Disconnect horn switch connector.
6. Remove nut from steering column that retains steering wheel.
7. Install steering wheel puller SA9218NE and remove steering wheel.



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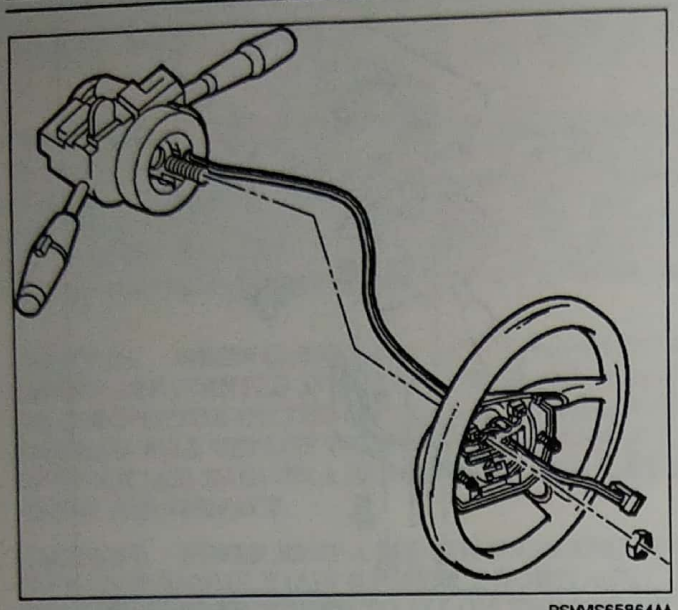
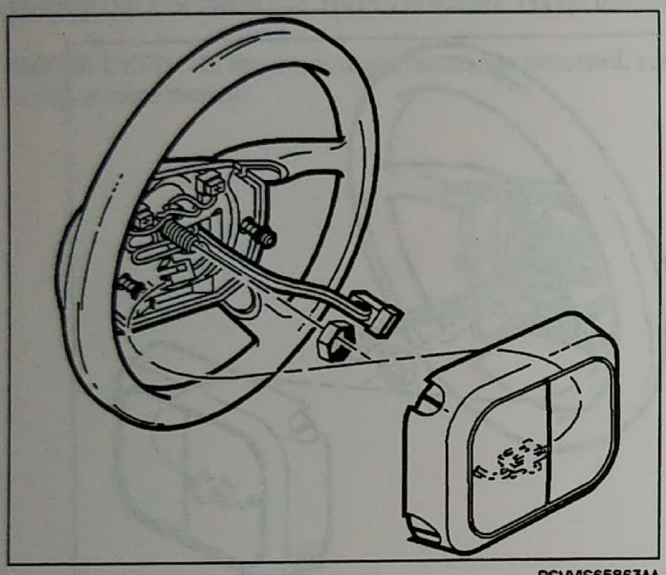


PSMIS65864AA

INSTALLATION

1. Route SIR cable through steering wheel. Install steering wheel to column. Connect horn wire connector.
2. Install steering wheel nut.

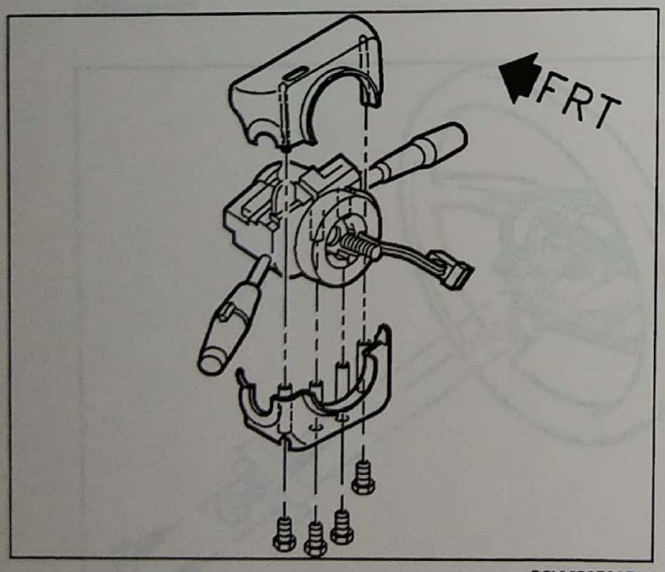
Torque: 42 N•m (31 ft−lbs)



PSMIS65863AA

3. Route yellow SIR inflator module wire harness within the steering wheel hub forming an "S" shape with wire.
4. Connect inflator module connector and install CPA.
5. Install SIR inflator module to steering wheel.

Torque: 10 N•m (7 ft−lbs)



PSMIS65827AA

6. Install lower steering column trim cover to steering column and install inner screws.
7. Install upper steering column trim panel to steering column and install outer screws in lower steering column trim panel.
8. Enable the SIR system. (Refer to "Enabling the SIR System" in this service manual.)

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SIR COIL ASSEMBLY

CAUTION: SAFETY PRECAUTIONS MUST BE FOLLOWED WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG). AFTER DEPLOYMENT, THE INFLATOR MODULE (AIR BAG) SURFACE MAY CONTAIN A SMALL AMOUNT OF SODIUM HYDROXIDE, A BY-PRODUCT OF THE DEPLOYMENT REACTION, THAT IS IRRITATING TO THE SKIN AND EYES. MOST OF THE POWDER ON THE INFLATOR MODULE (AIR BAG) IS HARMLESS. AS A PRECAUTION, WEAR GLOVES AND SAFETY GLASSES WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG), AND WASH YOUR HANDS WITH MILD SOAP AND WATER AFTERWARDS.

CAUTION: WHEN CARRYING A LIVE INFLATOR MODULE (AIR BAG), MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. NEVER CARRY INFLATOR MODULE (AIR BAG) BY THE WIRES OR CONNECTOR ON THE UNDERSIDE OF THE MODULE. IN CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG WILL DEPLOY WITH MINIMAL CHANCE OF INJURY. WHEN PLACING A LIVE INFLATOR MODULE (AIR BAG) ON A BENCH OR OTHER SURFACE, ALWAYS FACE BAG AND TRIM COVER UP, AWAY FROM THE SURFACE.

CAUTION: NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE (AIR BAG) FACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE INFLATOR MODULE (AIR BAG) TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY COULD RESULT.

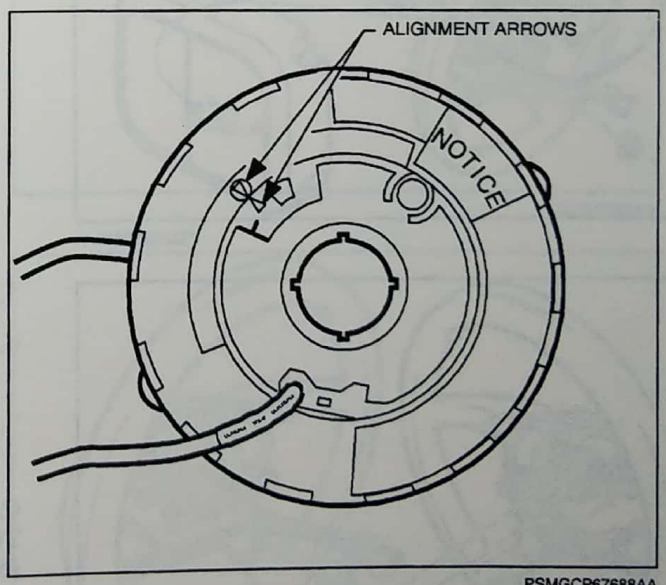
IMPORTANT: In the event deployment has occurred, refer to "Repairs and Inspections Required After an Accident" in this service manual.

REPOSITIONING SIR COIL ASSEMBLY

IMPORTANT: If orange tab is inadvertently removed prior to installation, the SIR coil assembly will remain in the locked position until it is installed. The locking device will be depressed after installation and the coil assembly will rotate freely when the steering column is rotated. If the locking devise is depressed prior to installation and the coil assembly is rotated, the coil will need to be realigned by following the steps listed below.

IMPORTANT: If coil assembly is not properly oriented to steering column/gear assembly the coil will be damaged.

1. Depress the tab and spring assembly in the rear of coil assembly.
2. Gently rotate coil hub **clockwise** with tab removed until slight tension is present.
3. Gently rotate coil hub **counterclockwise** (count approximately five revolutions) until slight tension is present.
4. Gently rotate coil hub **clockwise** one half of the number of revolutions counted in step 2 (approximately 2 1/2 to 3 turns).
5. Rotate smallest distance required to align the inner arrow (yellow) to outer arrow (black).



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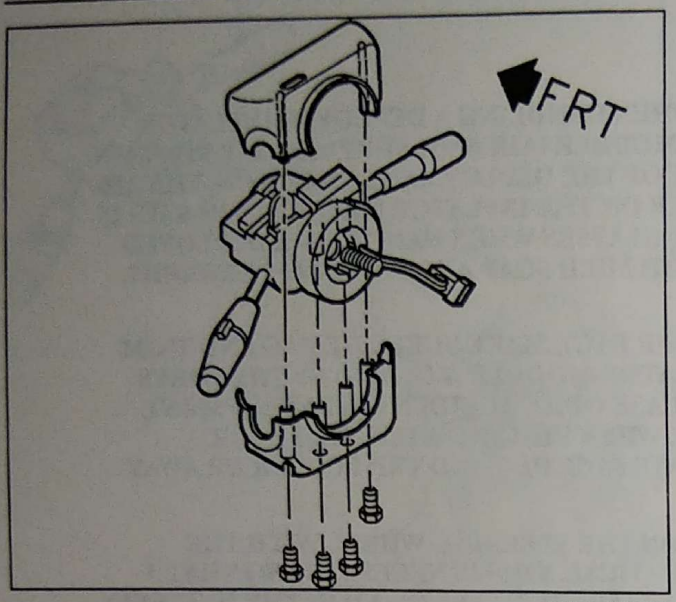
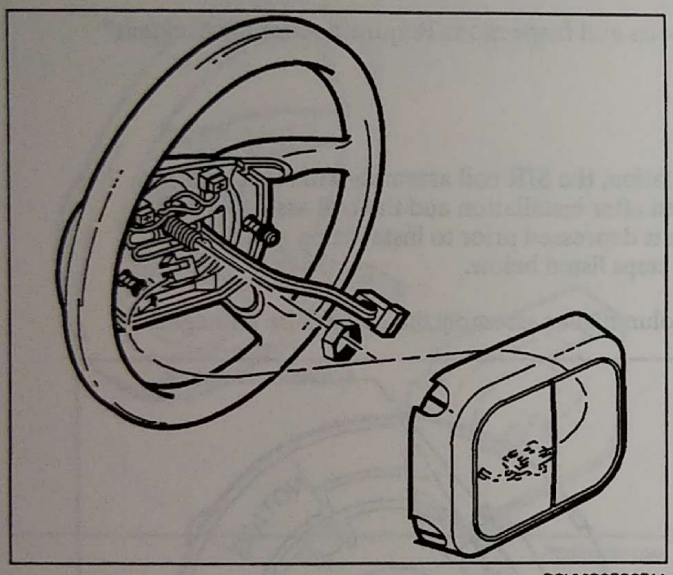
SIR ROLL COIL REMOVAL



PSMMS65827AA

REMOVAL

1. Disable the SIR system. (Refer to "Disabling the SIR System" in this service manual.)
2. Remove outer screws from lower steering column trim cover and lift upper trim panel off.
3. Remove inner screws from lower steering column trim cover to remove lower trim cover.



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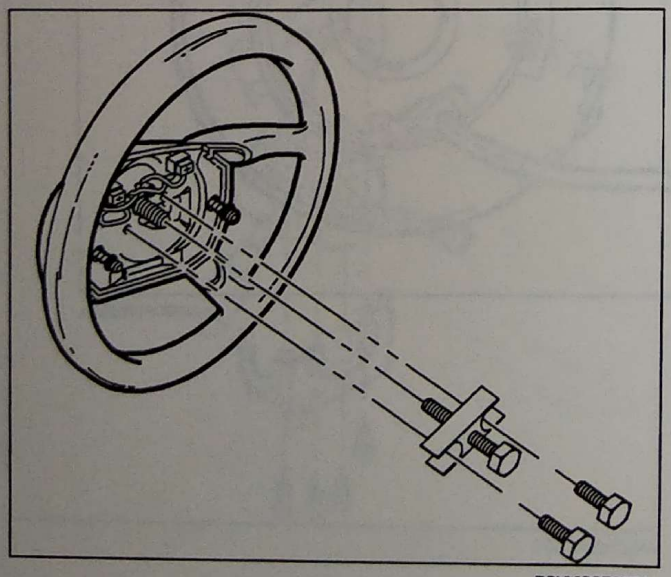
4. Remove screws from back of steering wheel that retains SIR inflator module. Remove connector position assurance (CPA) from SIR inflator module connector and disconnect the connector. Remove SIR inflator module.



PSMMS65862AA

5. Disconnect horn switch connector.
6. Remove nut from steering column which retains the steering wheel.
7. Install steering wheel puller SA9218NE and remove steering wheel.

CAUTION: ALWAYS ALIGN THE FRONT WHEELS TO THE STRAIGHT AHEAD POSITION WHEN INSTALLING OR REMOVING AN SIR COIL ASSEMBLY. IF AN SIR COIL ASSEMBLY IS REMOVED WITHOUT THE WHEELS IN THE STRAIGHT AHEAD POSITION AND THE STEERING WHEEL HAS NOT BEEN MOVED, THE SAME SIR ASSEMBLY COIL CAN BE REINSTALLED IF THE COIL HUB HAS NOT BEEN ROTATED.

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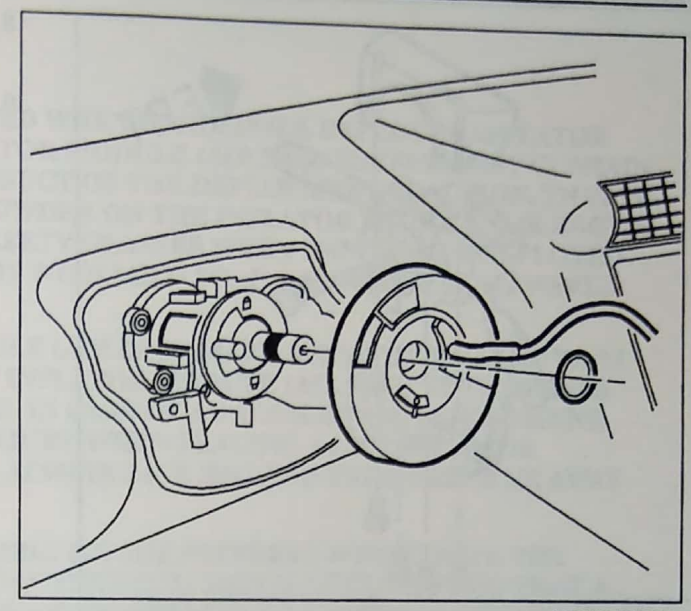
8. Remove snap ring from steering column shaft and disconnect SIR roll coil at base of column.
9. Slide SIR cable tie wrap down steering column shaft from underneath the instrument panel.
10. Cut tie wrap and remove SIR roll coil with wire.

INSTALLATION

IMPORTANT: A new SIR coil assembly is equipped with a orange tab that is removed after the steering wheel is installed. This tab passes through the steering wheel at the pass through hole.

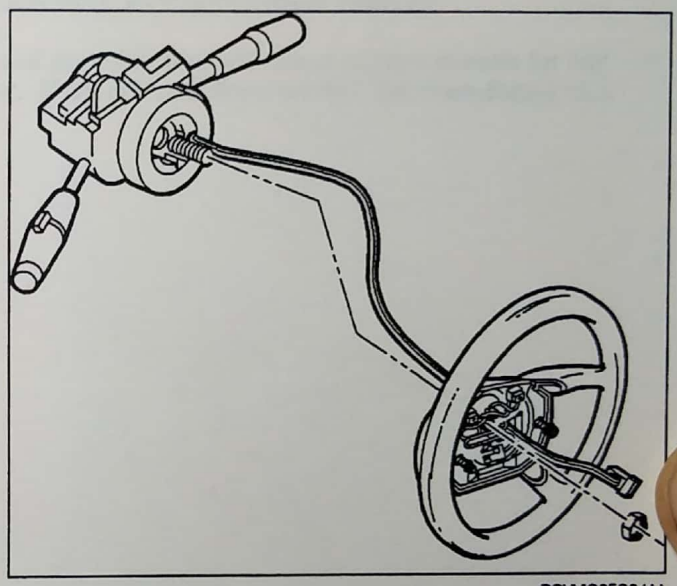
1. Route SIR coil harness down steering column.
2. Install SIR roll coil to steering column and install snap ring. Verify snap ring is seated on steering column.



PSMIS66345AA

3. Route SIR wire through steering wheel. Install steering wheel to column. Connect horn wire connector.
4. Install steering wheel nut.

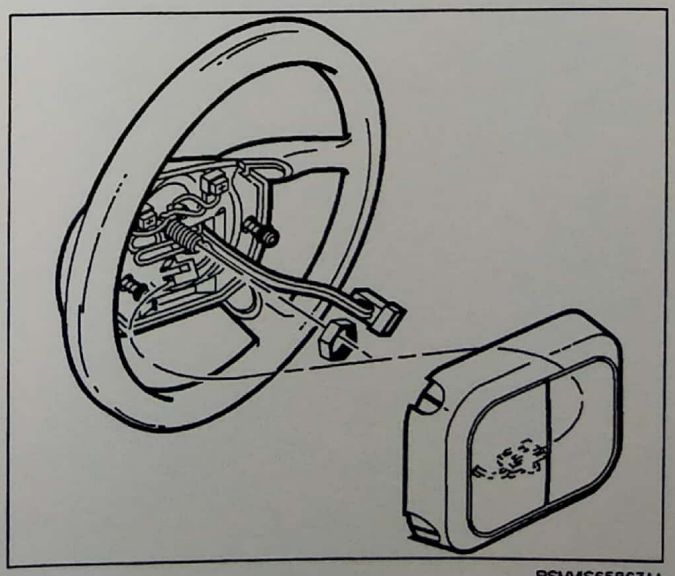
Torque: 42 N•m (31 ft–lbs)



PSMIS65864AA

5. Route yellow inflator module wire harness within the steering wheel hub forming an "S" shape with wire.
6. Connect inflator module connector and install CPA.
7. Install inflator module to steering wheel.

Torque: 10 N•m (89 in–lbs)



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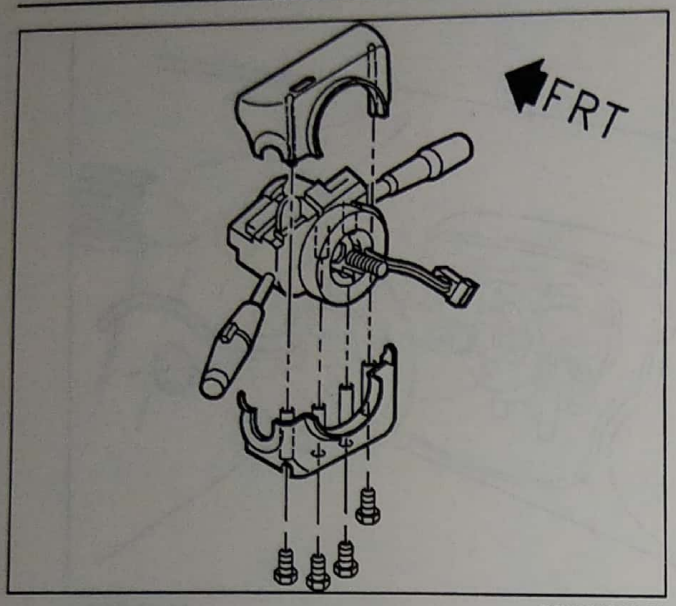

PSMMS65827AA

8. Align lower steering column trim cover to steering column and install inner screws.
9. Align upper steering column trim panel to steering column and install outer screws in lower steering column trim panel.

STEERING COLUMN

CAUTION: SAFETY PRECAUTIONS MUST BE FOLLOWED WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG). AFTER DEPLOYMENT, THE INFLATOR MODULE (AIR BAG) SURFACE MAY CONTAIN A SMALL AMOUNT OF SODIUM HYDROXIDE, A BY-PRODUCT OF THE DEPLOYMENT REACTION, THAT IS IRRITATING TO THE SKIN AND EYES. MOST OF THE POWDER ON THE INFLATOR MODULE (AIR BAG) IS HARMLESS. AS A PRECAUTION, WEAR GLOVES AND SAFETY GLASSES WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG), AND WASH YOUR HANDS WITH MILD SOAP AND WATER AFTERWARDS.

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CAUTION: NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE (AIR BAG) FACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE INFLATOR MODULE (AIR BAG) TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY COULD RESULT.

IMPORTANT: In the event deployment has occurred, inspect coil assembly wire and driver inflator module for any signs of scorching, melting or other damage due to excessive heat. If the coil or inflator module has been damaged, it must be replaced.

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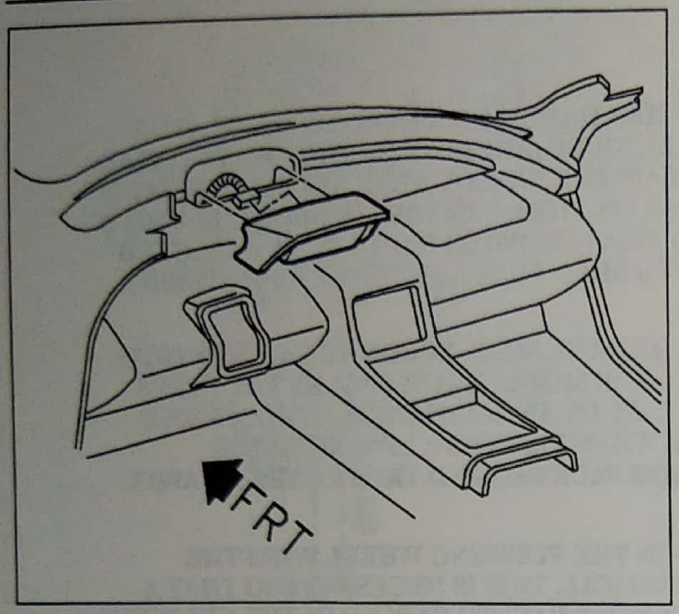
STEERING COLUMN

REMOVAL

1. Disable the SIR system. (Refer to "Disabling the SIR System" in this manual.)
2. Remove instrument panel cluster (IPC) by lifting upward and rearward, disconnect the IPC connector.



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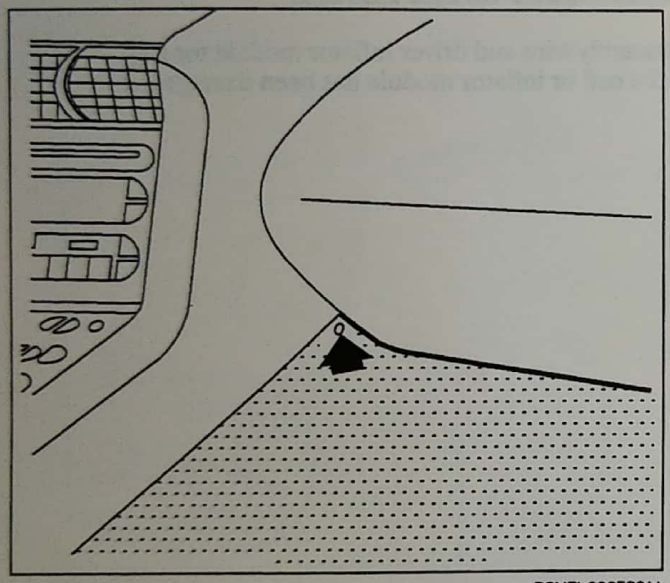
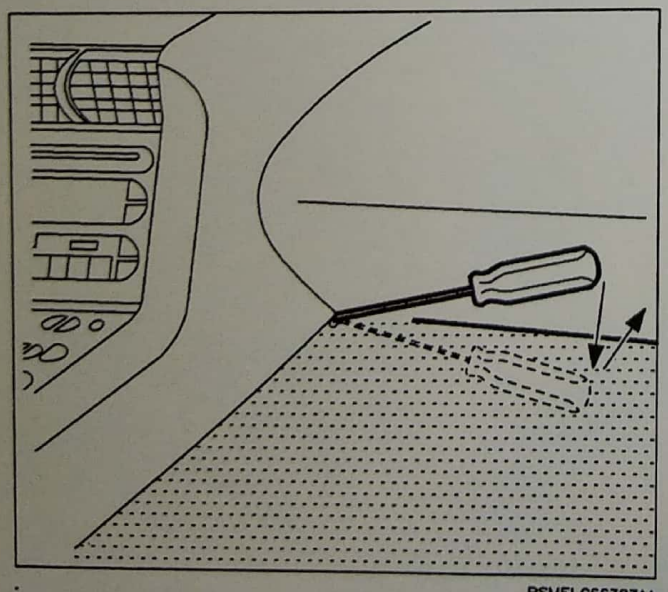


PSMELC66382AA

3. Locate hole in instrument panel tunnel bracket on right side behind carpet.
4. Use a knife to make a small slit in carpet over the hole.



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5. Insert a screwdriver with a blade about 152−304 mm (6 in.−12 in.) long into the hole in the instrument panel tunnel bracket. Slide screwdriver along instrument panel radio bracket until the screwdriver is wedged between bracket and the radio lock tab. The screwdriver should be inserted about 152mm (6 in.).

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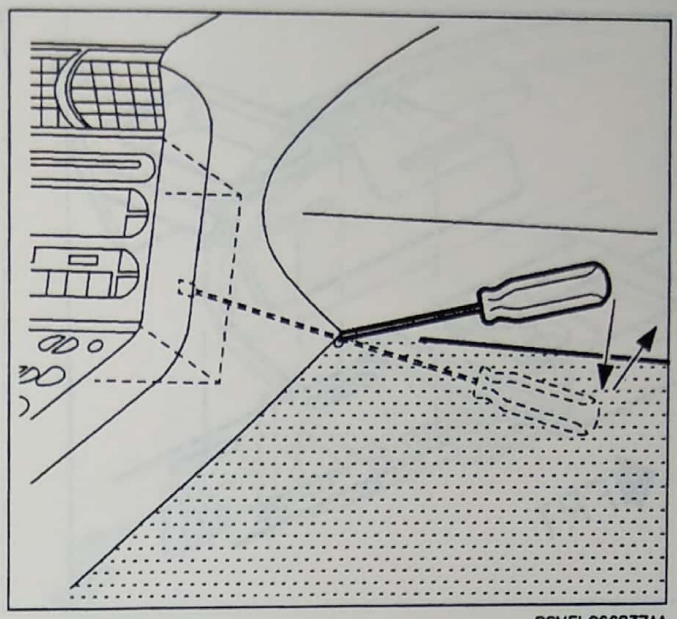
6. Push downward then forward on the screwdriver handle, lifting the lock tab upward and the radio rearward simultaneously. The radio should move rearward enough so that it can be pulled out the rest of the way by hand.
7. With the brake applied, shift run/lock shift assembly (RSA) to DRIVE, then select ACCY mode to shut Off power and apply the parking brake to keep the vehicle from rolling unexpectedly.
8. Lay a clean shop rag over the RSA to help protect it from getting scratched by the radio case during radio removal.
9. Slide radio out of instrument panel.



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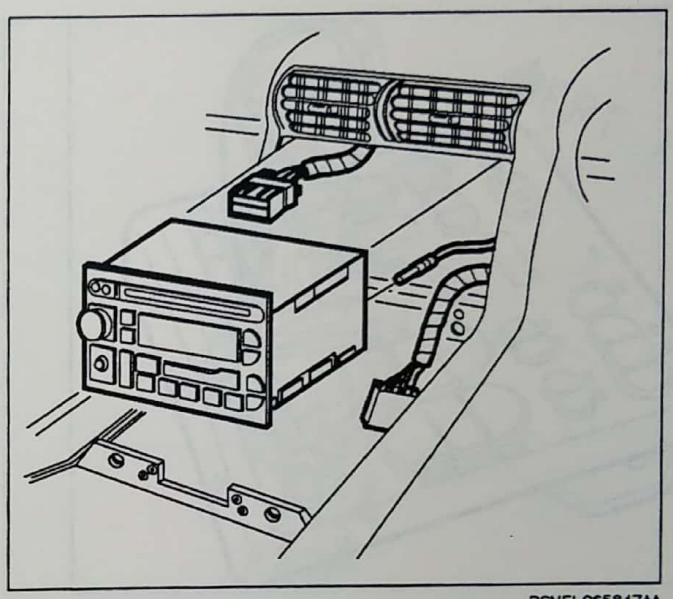
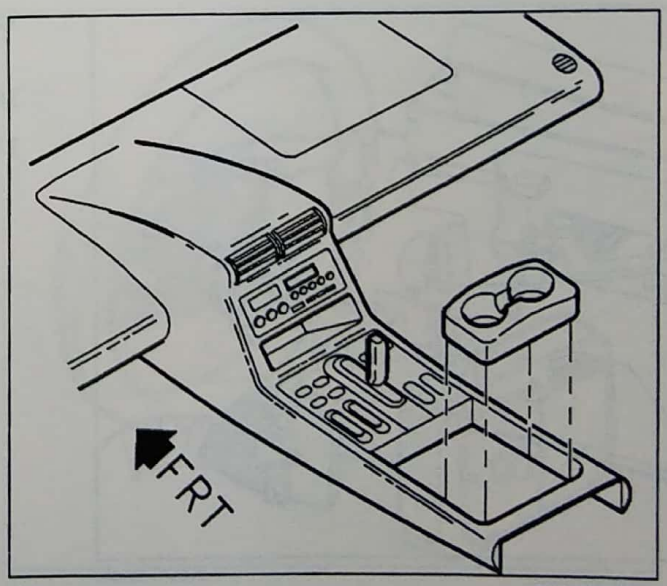
10. Disconnect the antenna lead first, then the harness connector.
11. With the brake applied, select the RUN mode again, and shift back to PARK. Then select the lock mode to turn the vehicle Off.

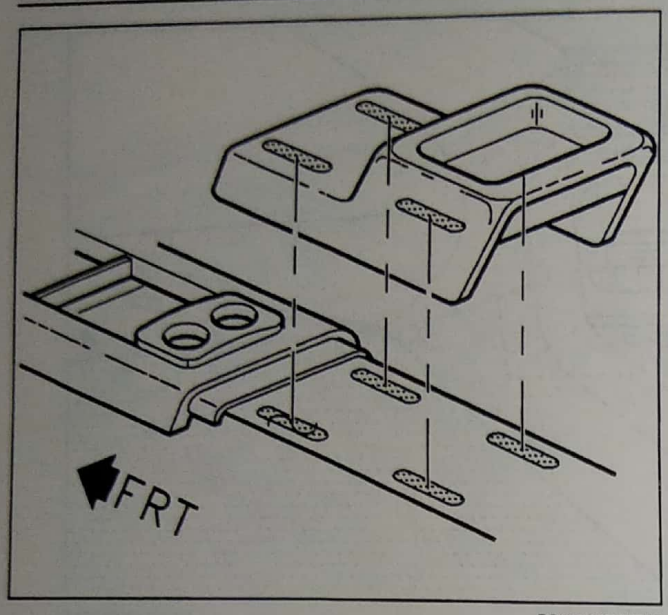


PSMELC65847AA

12. Remove cup holder.

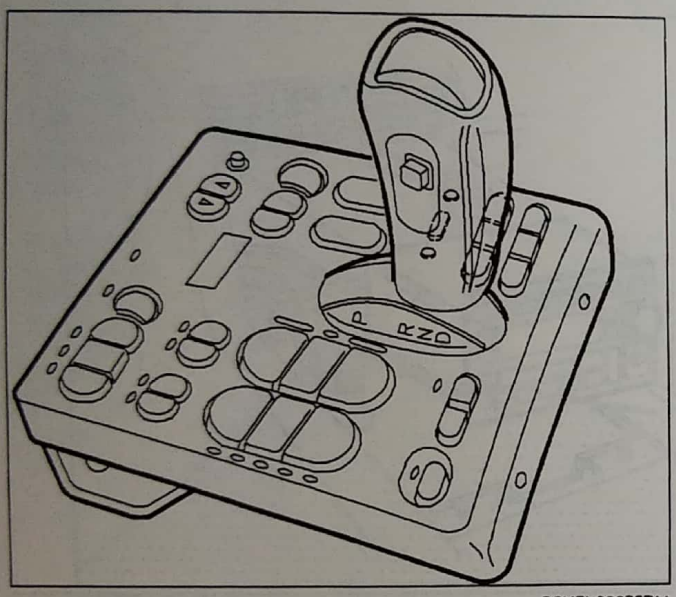


PSMMS65734AA



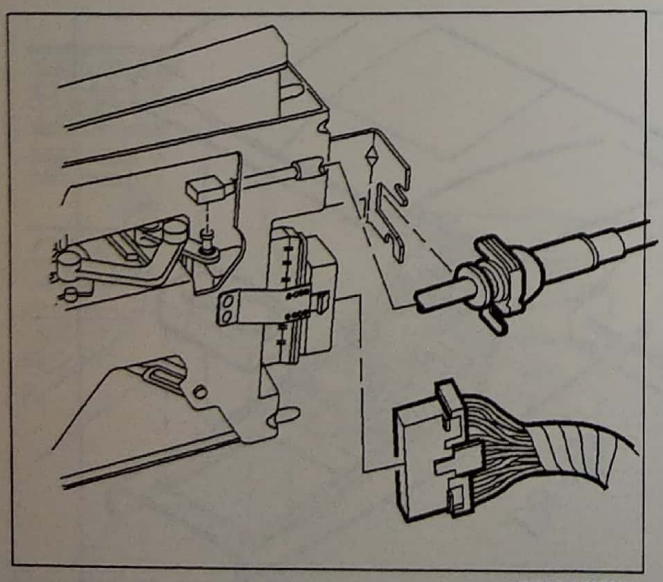
PSMMS65735AA

13. Remove arm rest from tunnel by lifting upward releasing Dual-Lock retainers.



PSMELC66357AA

14. Remove the T–25 TORX™ screws in the rear of the RSA, pull RSA rearward about 63 mm (2.5 in.).



PSMELC66358AA

15. Rotate RSA towards the drivers side of the vehicle to a 45 degree angle.
16. Disconnect the RSA wire harness connector.
17. Disconnect the shift cable from the shifter and remove shift cable from retainer bracket by prying locking tab on drivers side of RSA gently and pushing cable down out of bracket.

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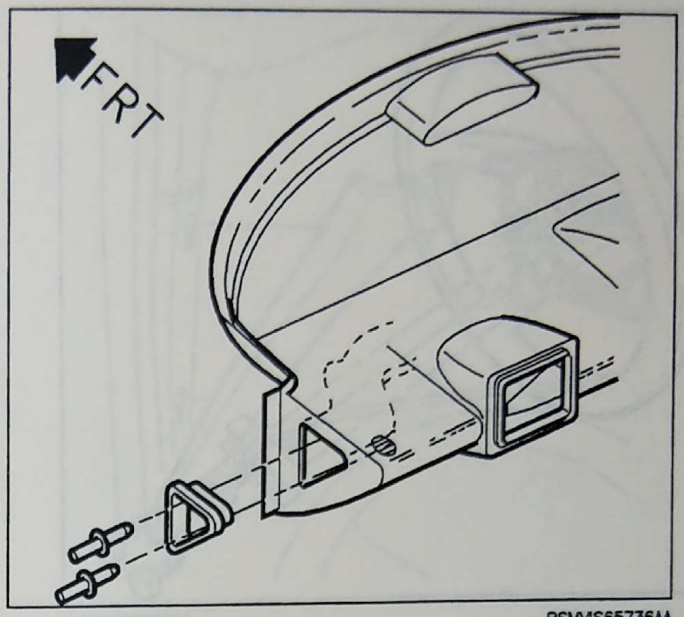
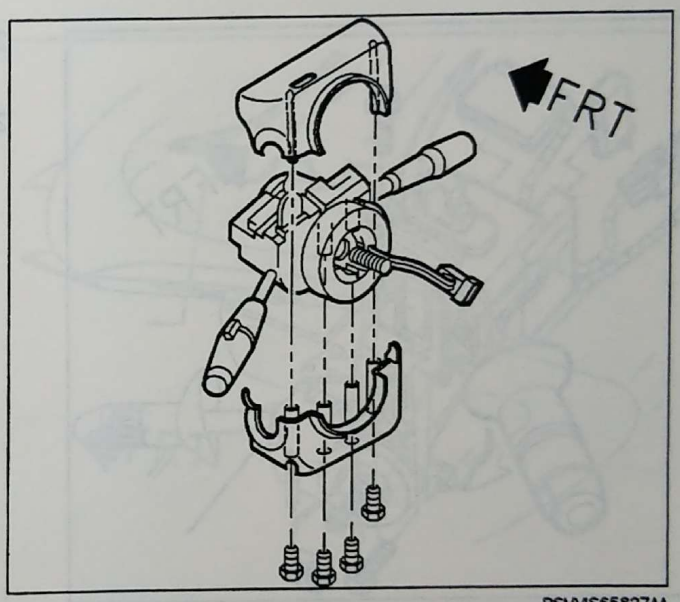
18. Drill out rivets from side door air outlets.
19. Remove left and right front side door air outlets on the side of instrument panel with doors open.



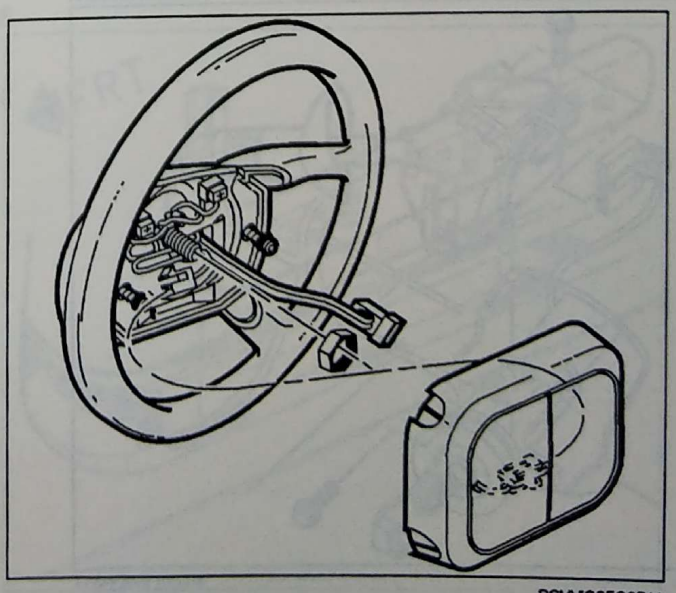
PSMMS65736AA

20. Remove outer screws from lower steering column trim cover, lift upper trim panel off.
21. Remove inner screws from lower steering column trim cover and remove lower trim cover.



PSMMS65827AA

22. Remove screws from back of steering wheel that retains SIR inflator module.
23. Remove connector position assurance (CPA) and disconnect inflator module connector.
24. Remove SIR inflator module.



PSMMS65863AA

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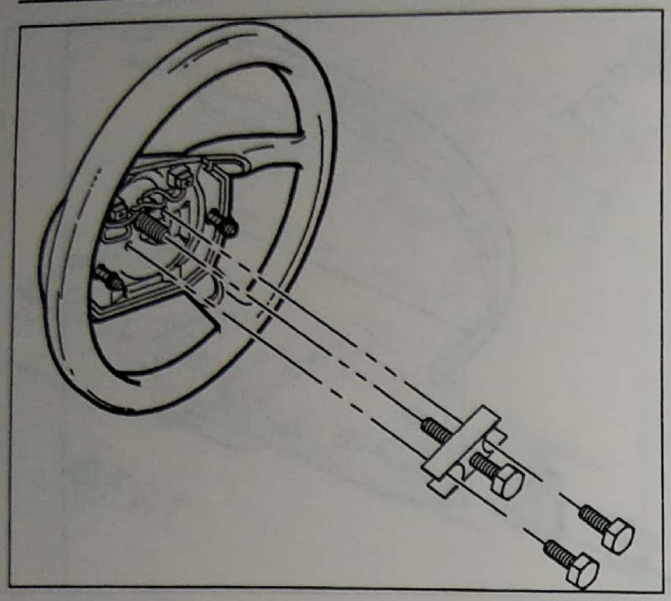
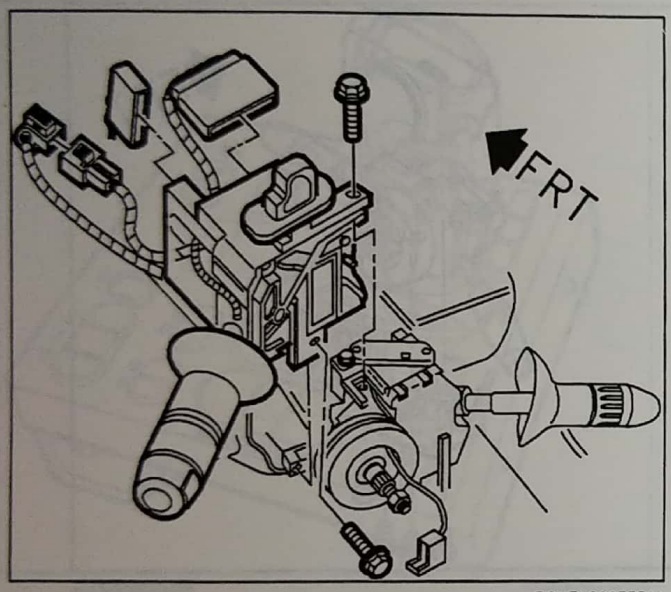


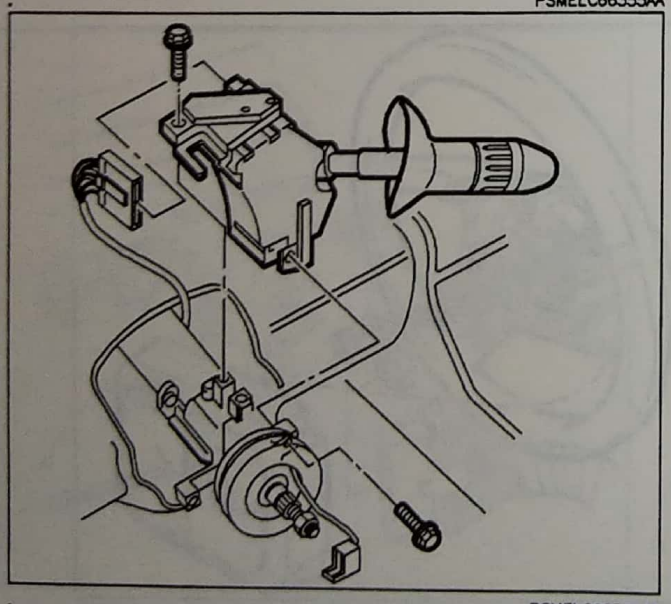
PSMVIS65862AA

25. Disconnect horn switch connector.
26. Remove nut from steering column that retains steering wheel.
27. Install steering wheel puller SA9218NE and remove steering wheel.



PSMELC66355AA

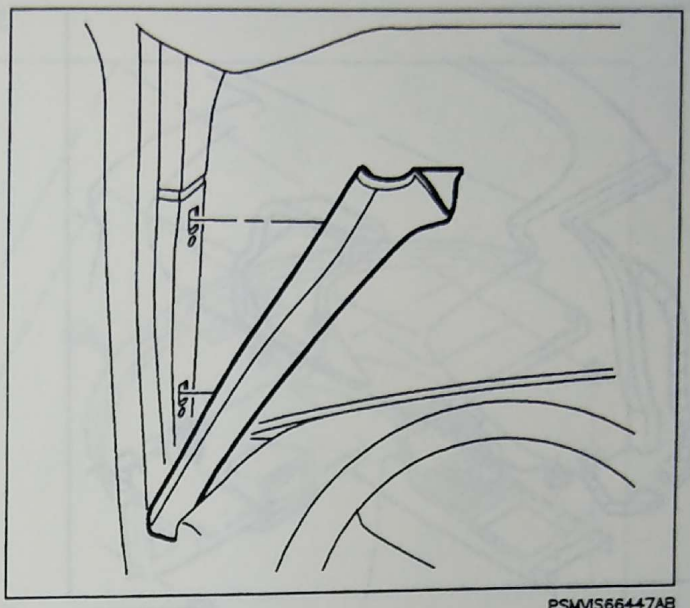
28. Remove T–25 TORX™ /7mm screws from turn signal, headlamp, and cruise switch.
29. Remove switch and disconnect switch connectors.



PSMELC66356AA

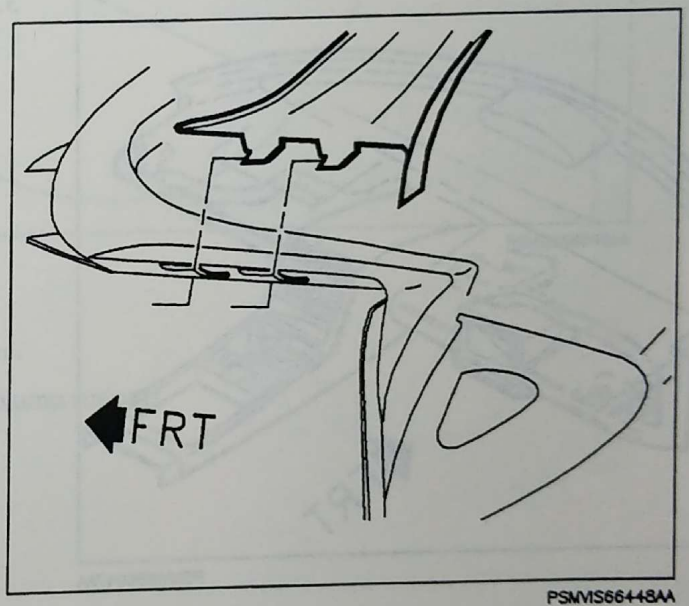
30. Remove T–25 TORX™ /7mm screws from windshield washer switch.
31. Disconnect connector and remove switch.

32. Starting at top of garnish molding, pull firmly at clip locations to disengage. Tipping the top of molding inward with the bottom engaged to instrument.



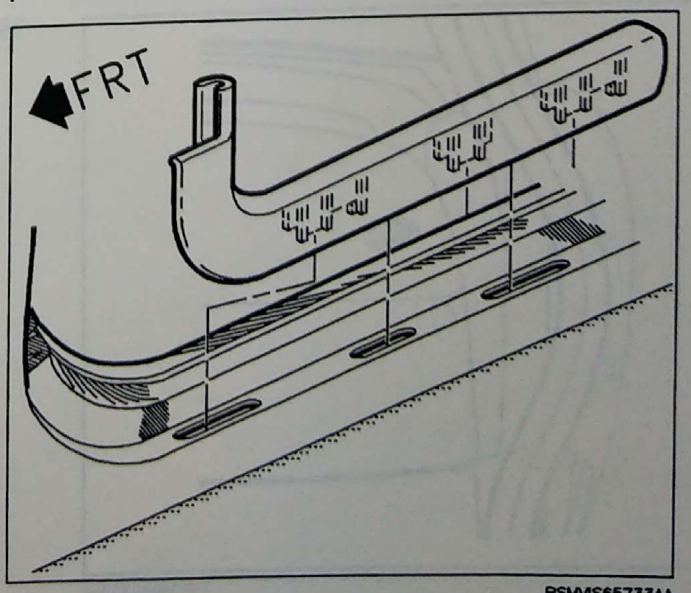
PSMIS66447AB

33. Disengage tabs on garnish molding from instrument panel by pulling rearward and inboard.

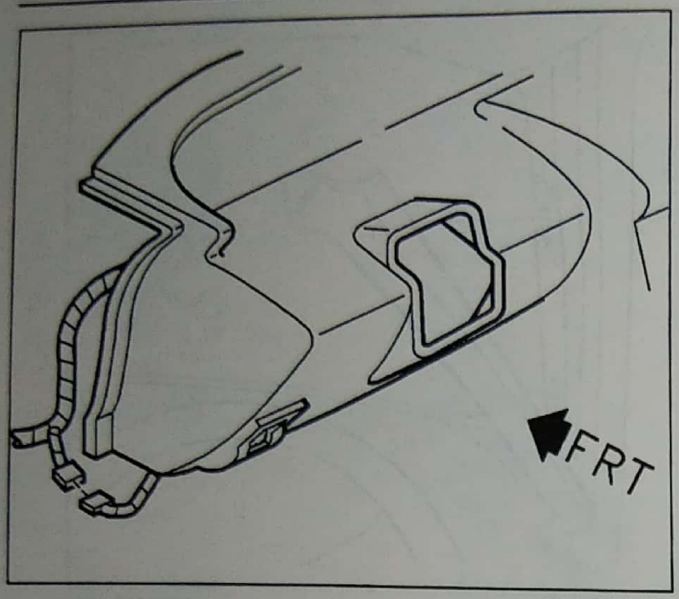


PSMIS66448AA

34. Starting at rear of carpet retainer, pull firmly on carpet retainer at clip locations to disengage clips.
35. Remove front side door opening floor carpet retainer.

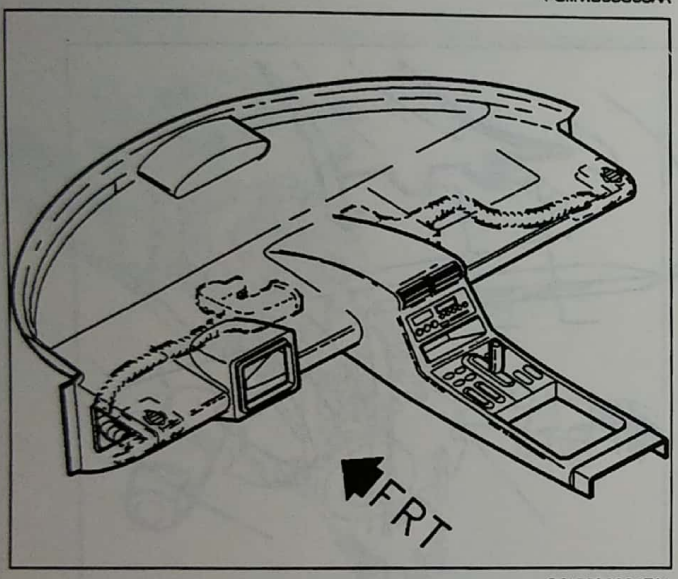


PSMIS65733AA



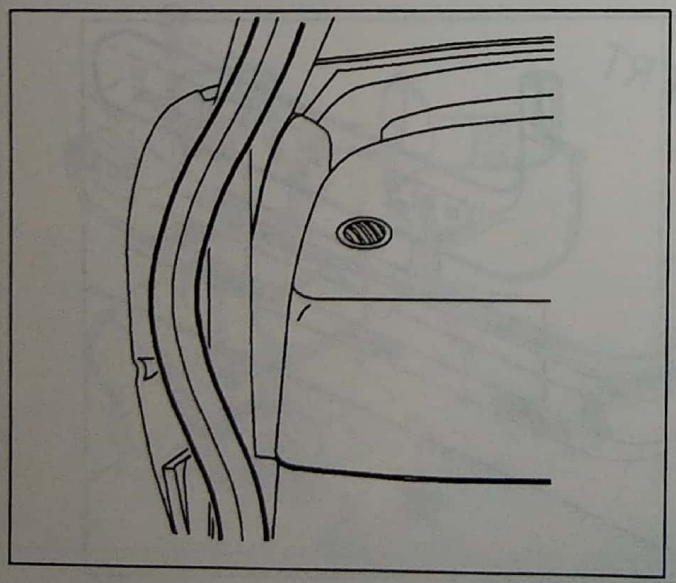
PSMMS65865AA

36. Disconnect parking brake switch connector.



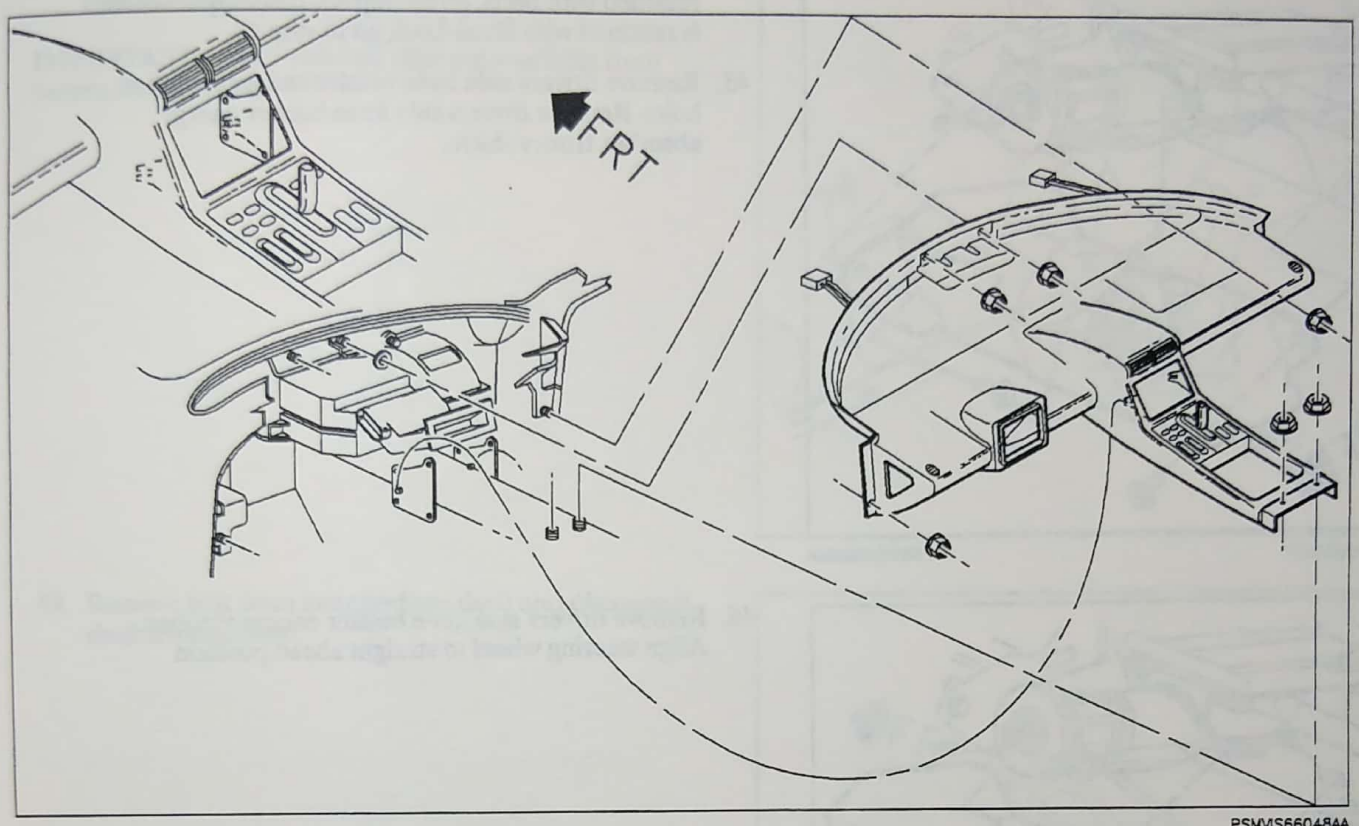
PSMMS66047AA

37. Disconnect side window demistor tubes from floor outlets.



PSMMS66337AA

38. Remove side door weatherstrip from pinch weld flange near instrument panel.



PSMVIS66048AA

39. Remove retainers from instrument panel.
40. Pull instrument panel rearward with slight upward pressure.
41. Pull driver's side demister tube through hole in steering column support
42. Disconnect both information telltale connectors.
43. Remove instrument panel from vehicle.

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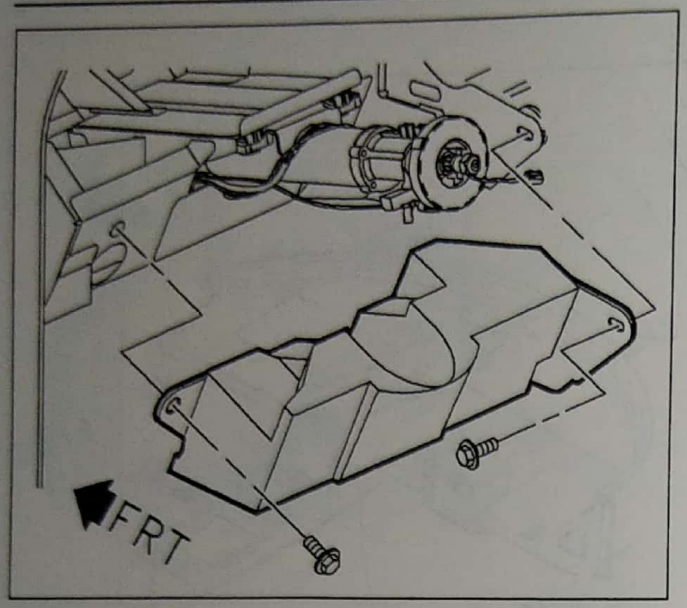
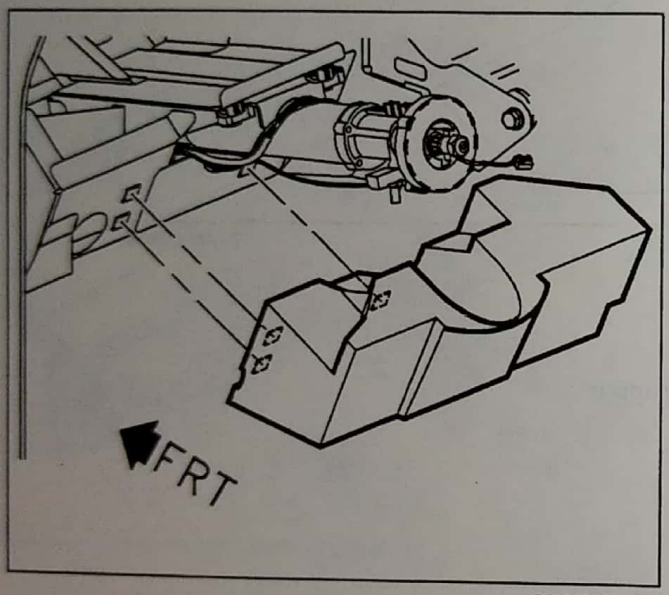


PSMVIS67898AA

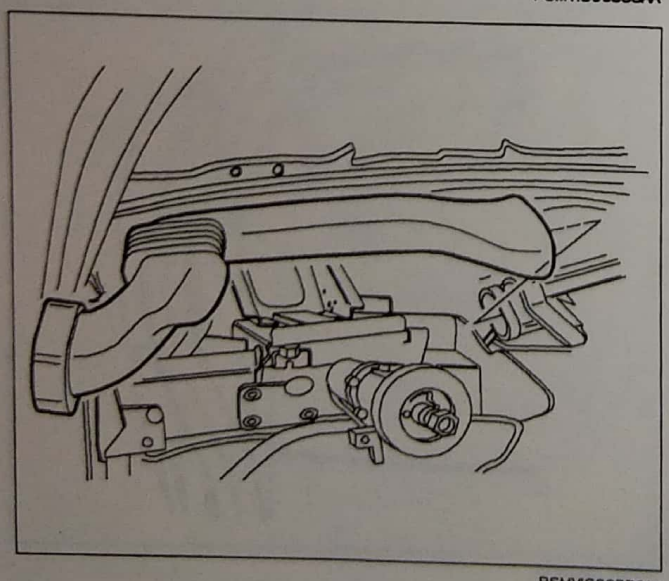
44. If Driver side knee bolster energy absorber is retained with bolts, go to step 45. If energy absorber is retained with Dual-Lock go to step 46.

45. Remove drivers side knee bolster energy absorber bolts. Remove drivers side knee bolster energy absorber from vehicle.



PSMVIS66338AA

46. Remove drivers side knee bolster energy absober. Align steering wheel to straight ahead position



PSMVIS66336AA

47. Remove drivers side outer air duct.

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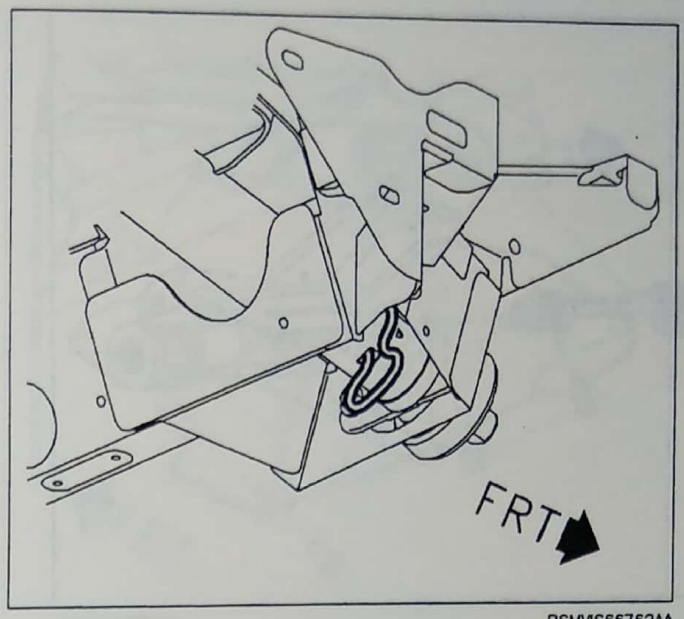
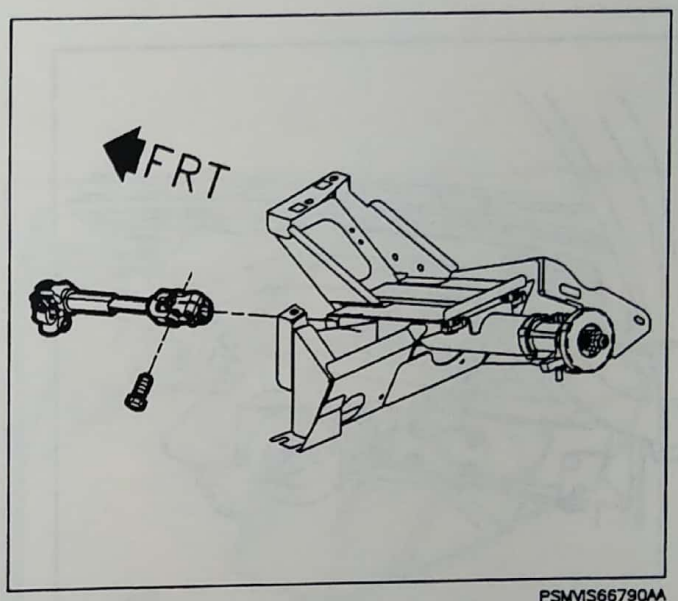
48. Install steering column anti-rotation clip in to base of column shaft.

IMPORTANT: Anti-rotation clips are available from Saturn Service Parts.



PSMVIS66762AA

49. Remove bolt from intermediate shaft and disconnect shaft from column.



PSMVIS66790AA

50. Remove bolts and nuts that retain steering column to steering column support. Remove steering column from vehicle.

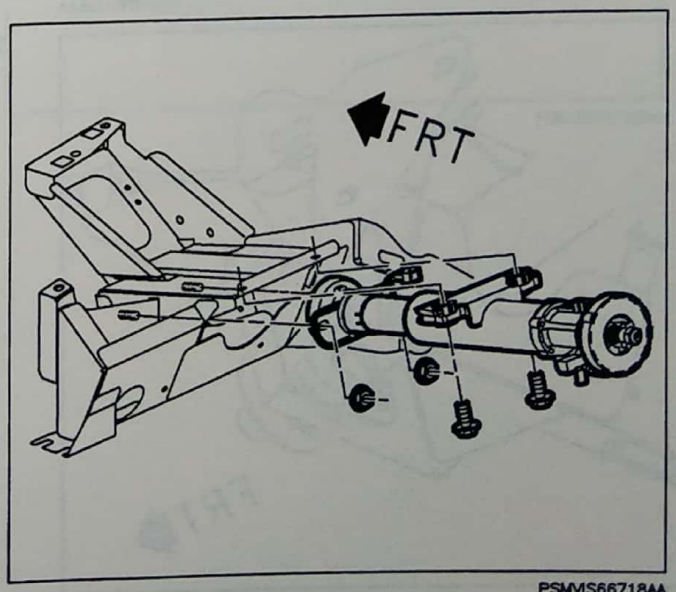
INSTALLATION

1. Load steering column into steering column support aligning studs on support to base of steering column.
2. Start bolts at upper mount of steering column and hand tighten.
3. Install nuts at base of steering column.

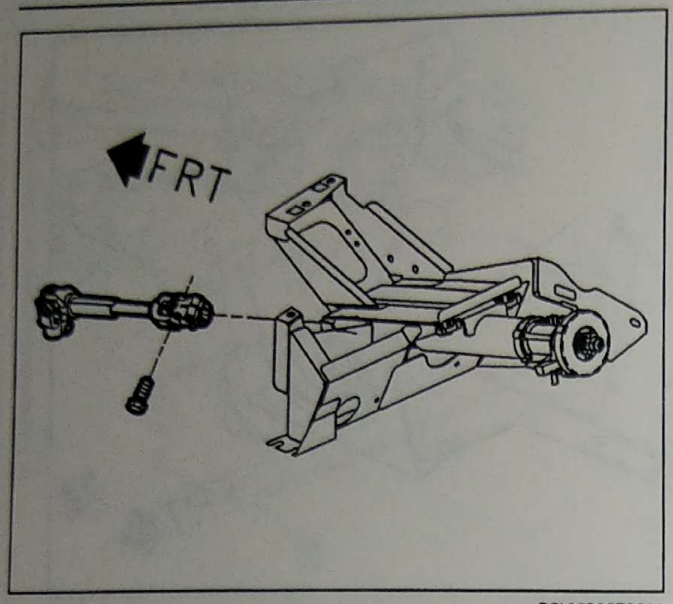
Torque: 25 N•m (19 ft–lbs)

4. Tighten bolts at upper mount of steering column.

Torque: 25 N•m (19 ft–lbs)



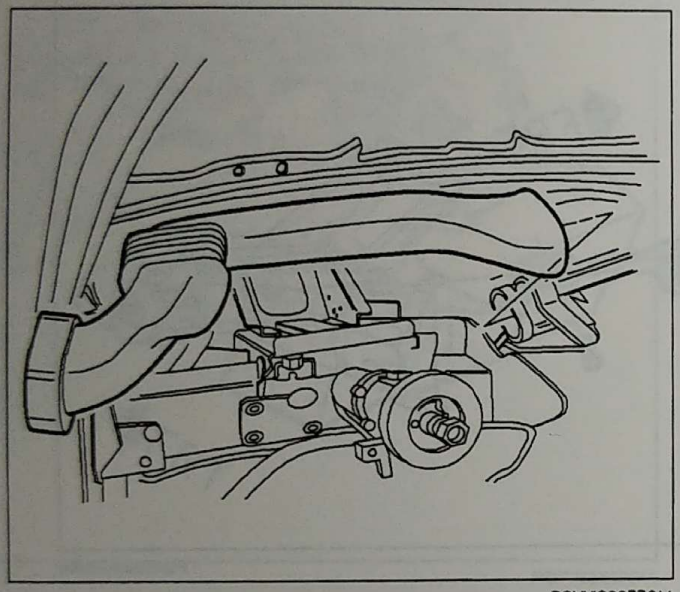
PSMVIS66718AA



PSMVIS66790AA

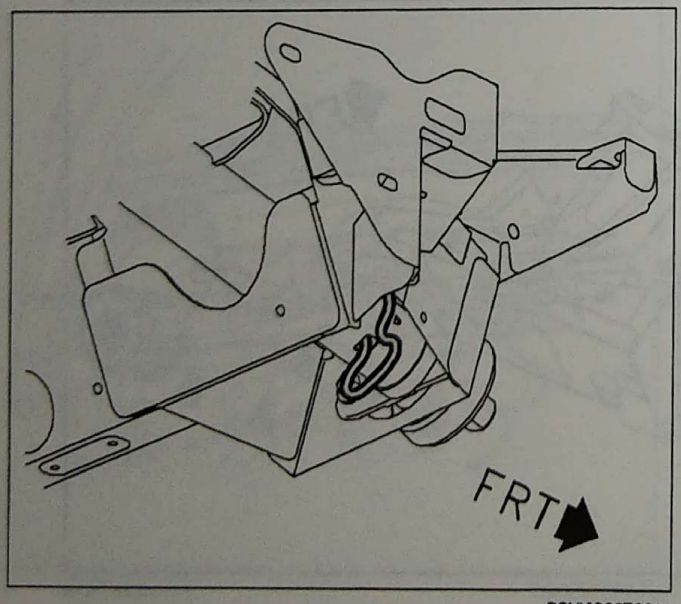
5. Fit intermediate shaft to splined end of steering column and install bolt to intermediate shaft.

Torque: 47 N•m (35 ft−lbs)



PSMVIS66336AA

6. Install driver side outer air duct.

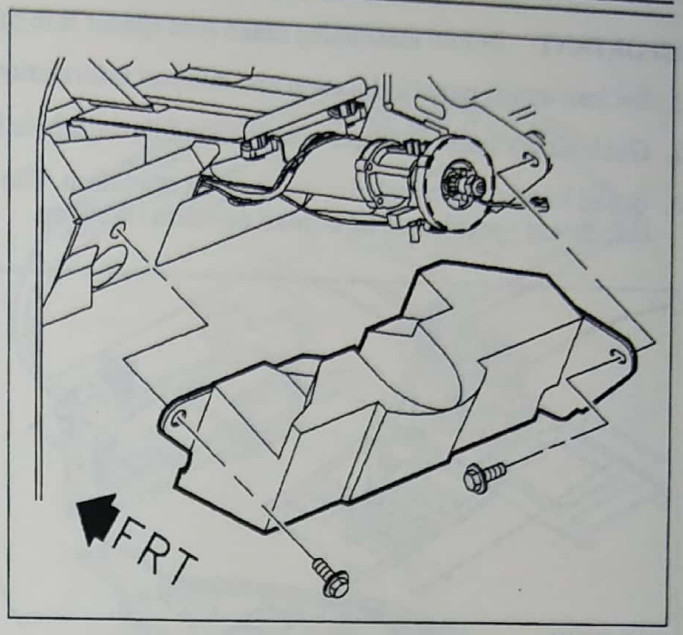


PSMVIS66762AA

7. Remove anti-rotation clip from base of steering column.

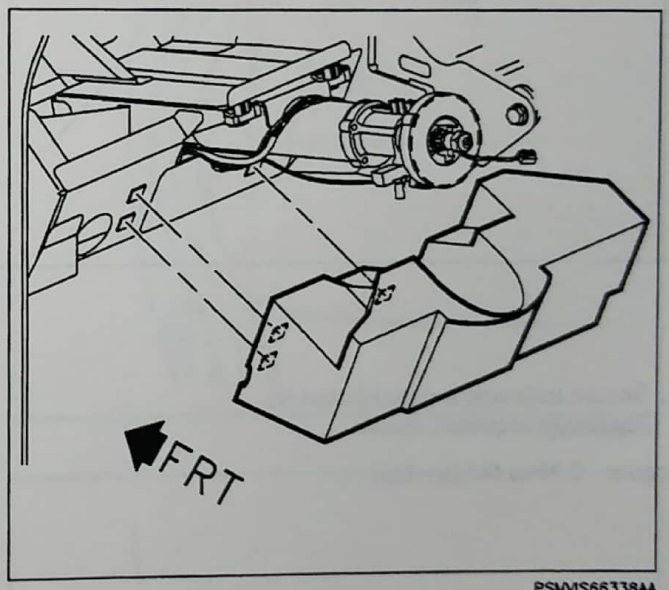
8. If drivers side knee bolster energy absorber is retained with bolts, go to step 9. If energy absorber is retained with Dual-Lock, go to step 10.
9. Align driver side knee bolster energy absorber and install bolts.

Torque: 25 N•m (19 ft−lbs)



PSMIS67898AA

10. Install driver's side knee bolster energy absorber.



PSMIS66338AA

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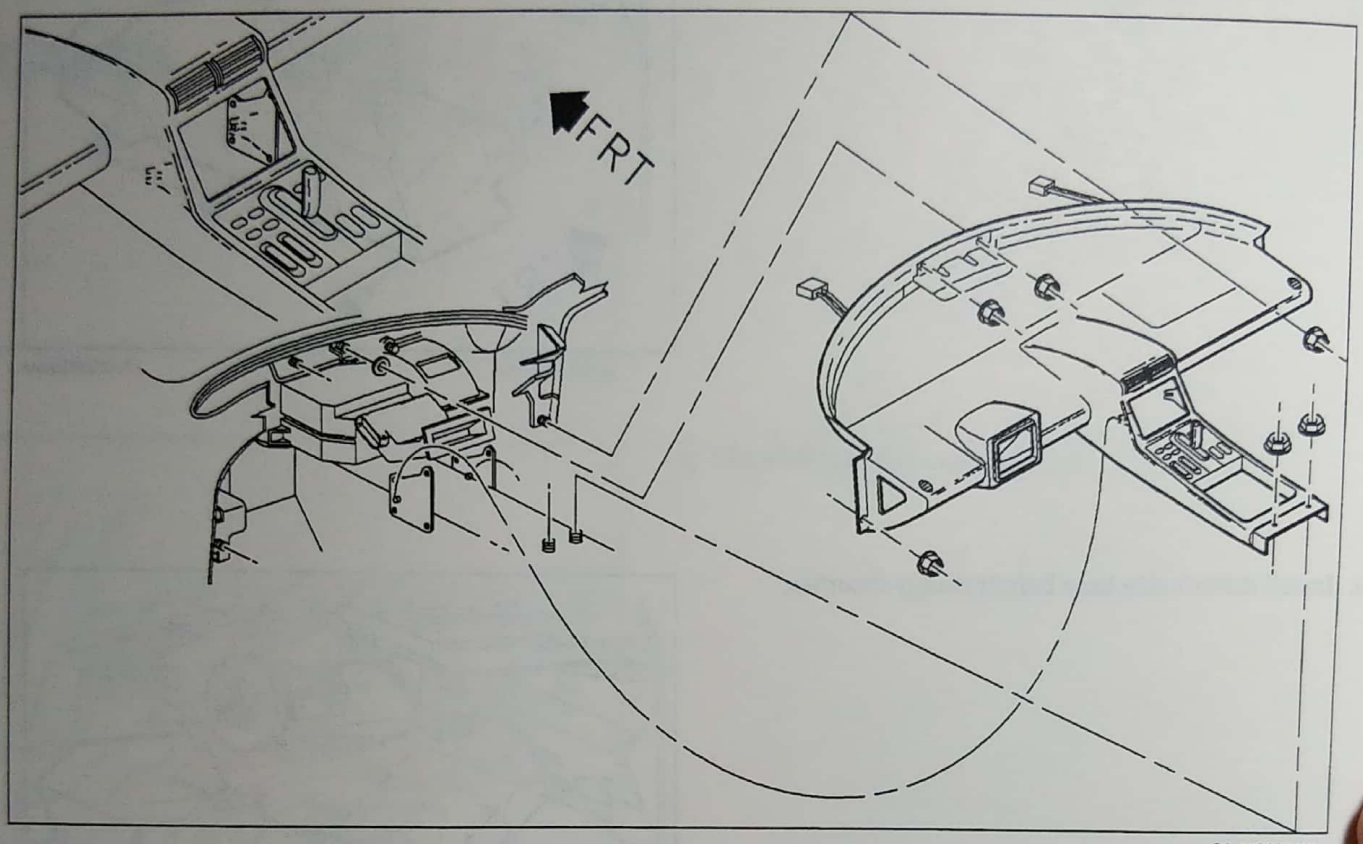
IMPORTANT: Before assembling make sure spacer is in proper location to body. Refer to illustration.

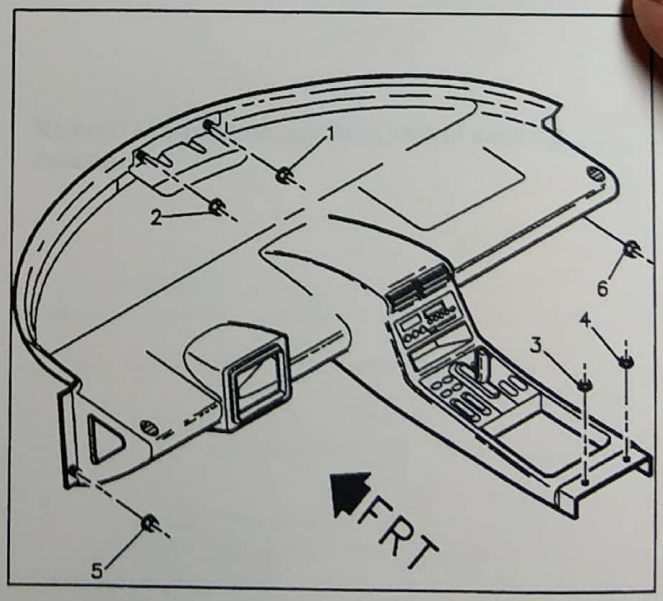
11. Set instrument panel in location and connect information telltale connectors.
12. Guide driver's side demister tube into and through hole in steering column support.
13. Install instrument panel over studs on front of dash. The tunnel has locator pins on either side of which the instrument panel has to be located on when installing.



PSMVIS66048AA

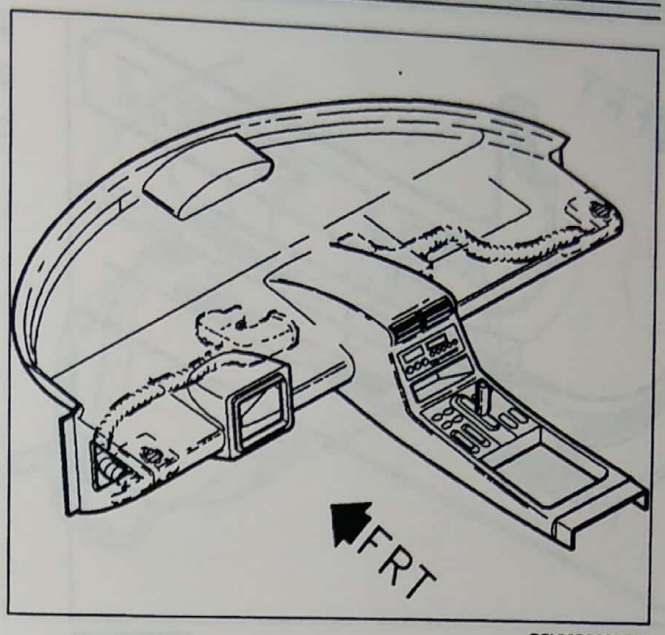
14. Secure instrument panel fasteners. Torque in sequence shown.

Torque: 5 N•m (44 in−lbs)



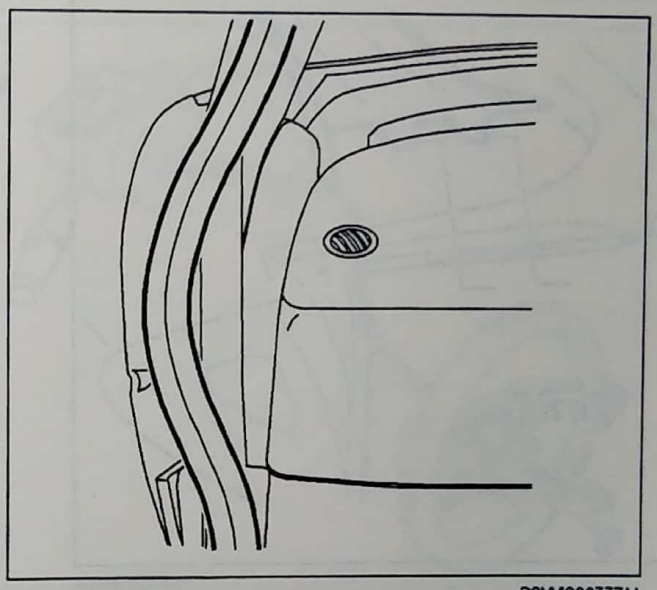
PSMVIS66049AA

15. Connect side window demister tubes to floor outlets.



PSMIS66047AA

16. Install side door weatherstrip onto pinch weld flange near instrument panel.



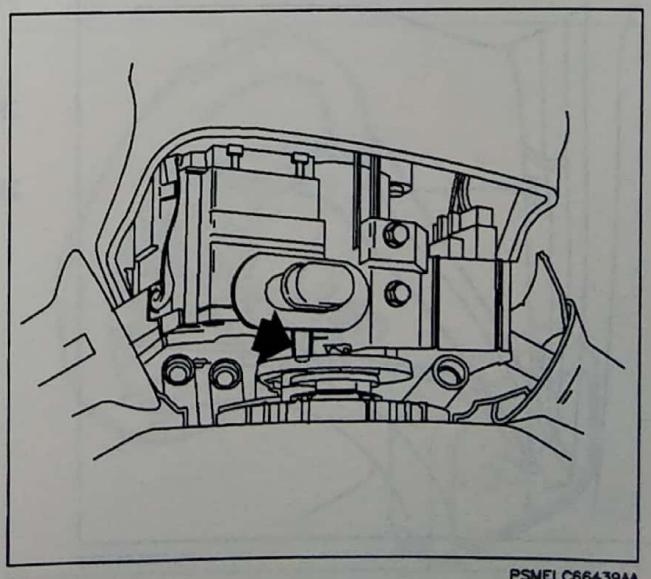
PSMIS66337AA

17. Connect connector to windshield washer switch.
18. Install screws retaining switch.

Torque: 2.5 N•m (22 in–lbs)

19. Connect connectors to turn signal, headlamp, and cruise switch.
20. Place switch in position, being careful that the pin is positioned correctly against the ring on the back of the turn signal cancel cam assembly.
21. Install screws retaining switch.

Torque: 2.5 N•m (22 in–lbs)



PSMELC66439AA

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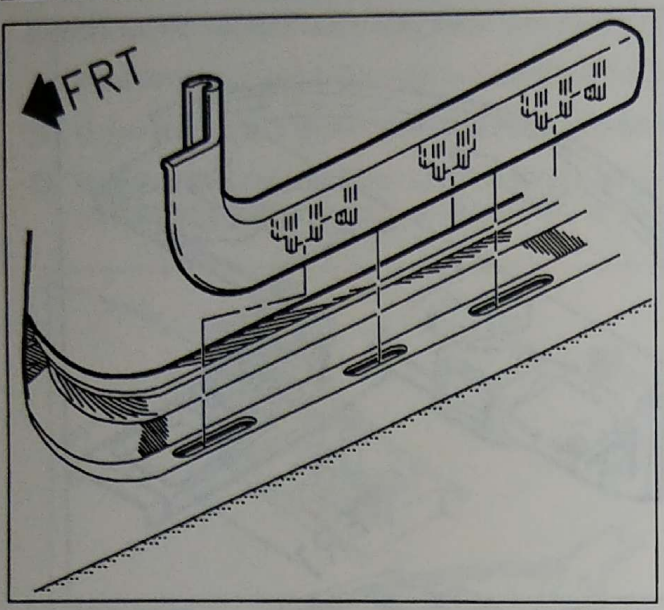
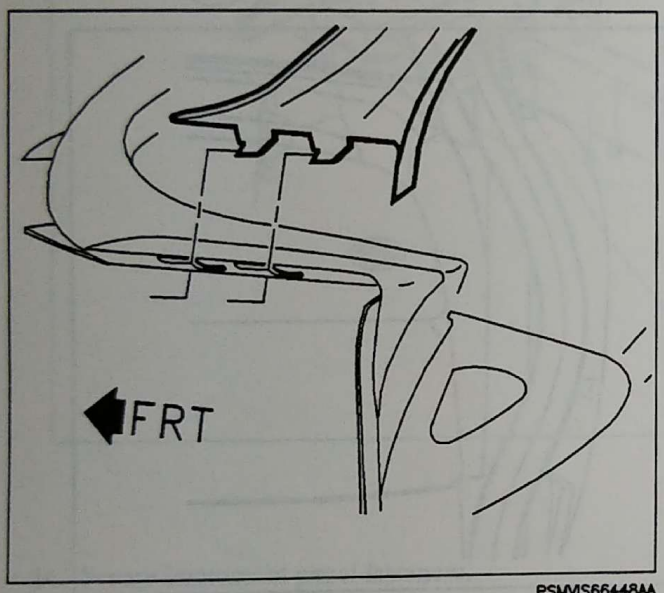


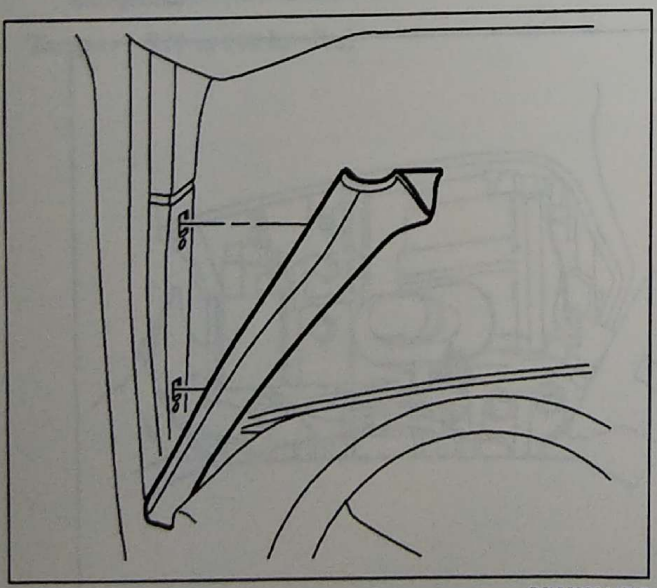
PSMMS65733AA

22. Locate carpet retainer to door opening.
23. Firmly seat carpet retainer into weather.
24. Snap clips into slots in inner rocker pan.



PSMMS66448AA

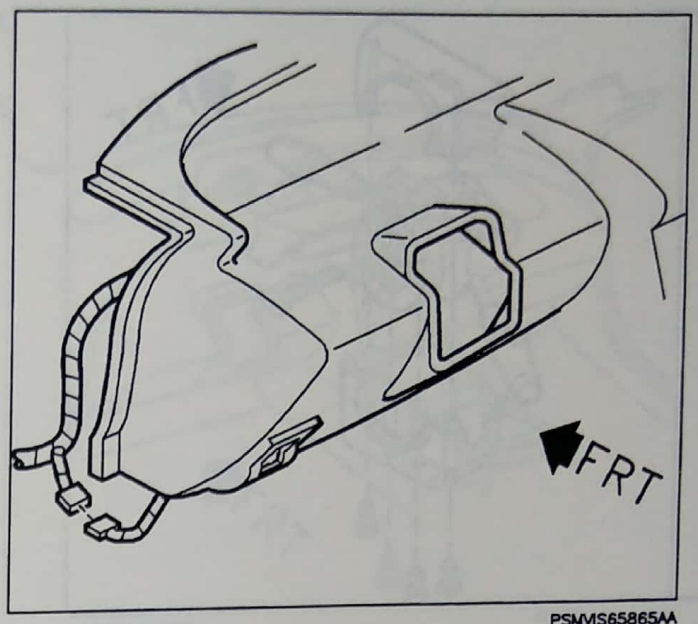
25. Insert tabs on bottom of garnish molding into instrument panel.
26. Push molding downward and forward past A-pillar structure.



PSMMS66447AB

27. Push molding to structure pressing forward and outward to insure proper fit to instrument panel, headlining and door seal.
28. Align clips on garnish molding to slots in A-pillar and press firmly at clip locations.
29. Position flap on door weatherstrip over windshield garnish molding.

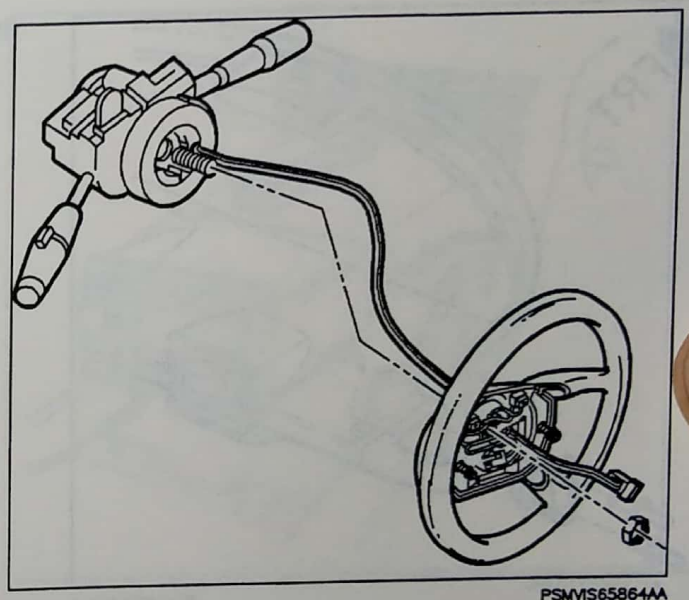
30. Connect park brake switch connector.



PSMIS65865AA

31. Route SIR cable through steering wheel. Install steering wheel to column.
32. Connect horn wire connector.
33. Install steering wheel nut.

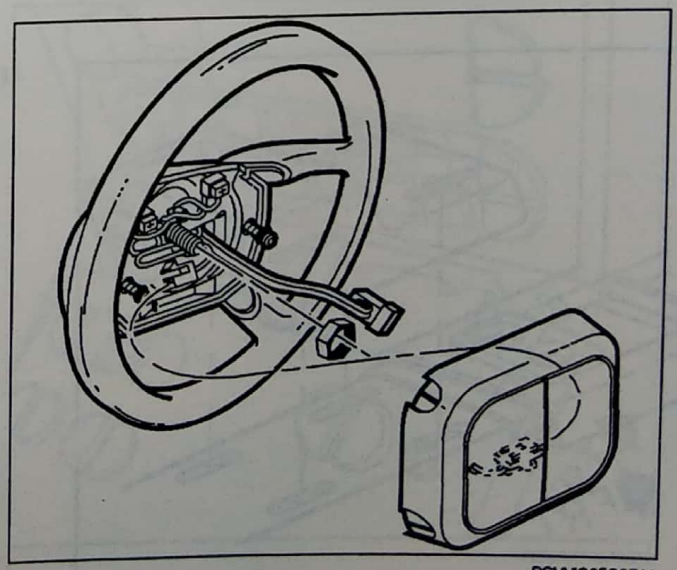
Torque: 42 N•m (31 ft−lbs)



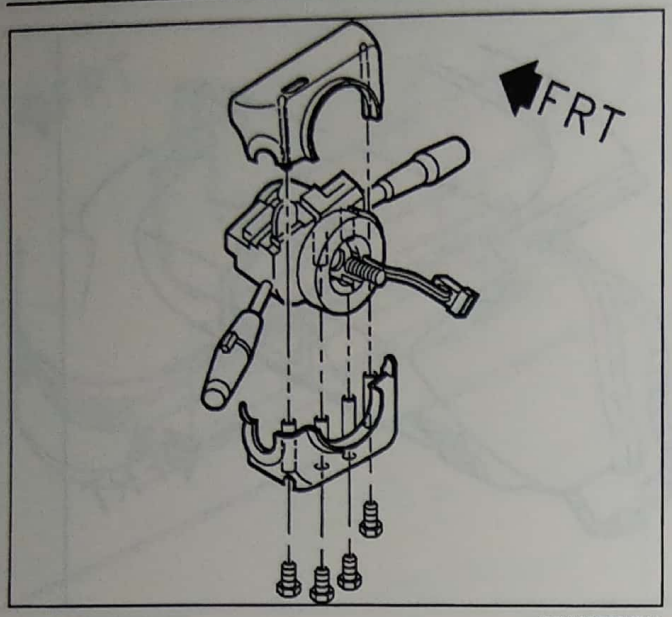
PSMIS65864AA

34. Route yellow SIR inflator module wire harness within the steering wheel hub forming an "S" shape with wire and connect SIR inflator module connector.
35. Install CPA, to connector.
36. Install inflator module to steering wheel.

Torque: 10 N•m (89 in−lbs)

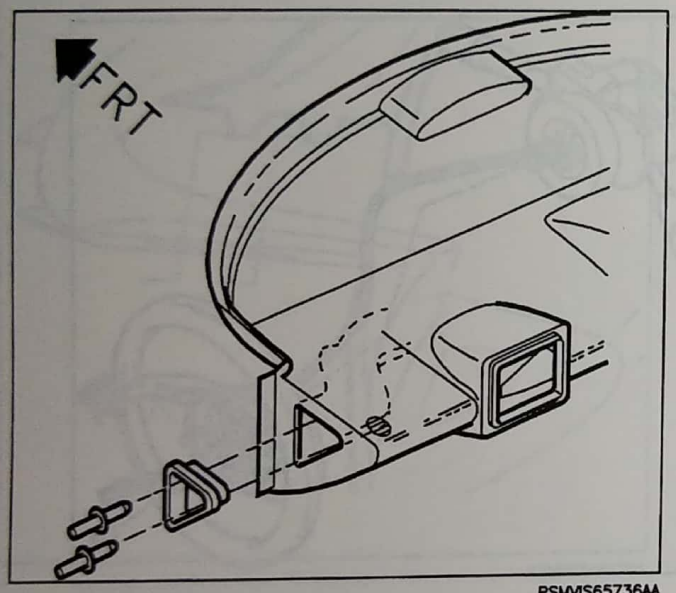


PSMIS65863AA



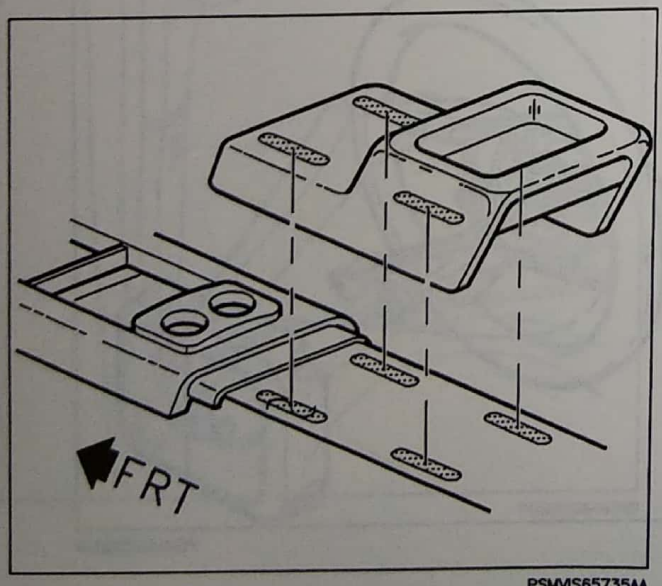
PSMMS65827AA

37. Align lower steering column trim cover to steering column. Install and tighten inner screws.
38. Align upper steering column trim panel to steering column and install outer screws in lower steering column trim panel. Tighten outer screws.



PSMMS65736AA

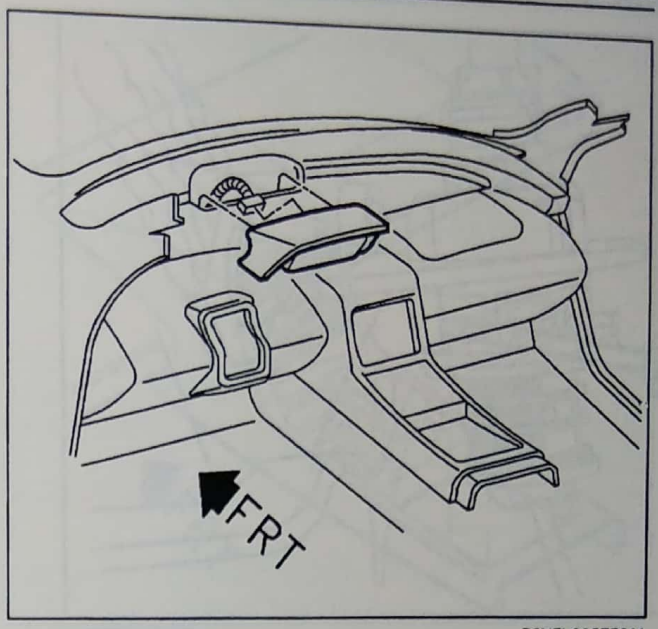
39. Install left and right front side door air outlets on side of the instrument panel using new fasteners.



PSMMS65735AA

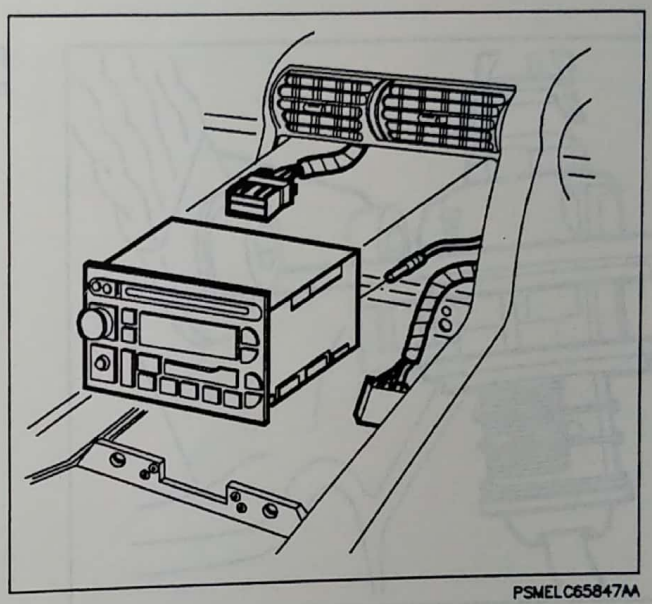
40. Install arm rest

41. Push harness connector into socket on instrument panel cluster. Verify connection is made, seated and locked.
42. Install instrument panel cluster into instrument panel by pushing forward and downward.



PSMELC66359AA

43. Connect radio harness to radio, then antenna lead to radio. Verify both connections are seated properly.
44. Make sure antenna and harness are up and out of the way of the radio bracket. Slide radio into opening until the radio is seated and the radio fits tightly to the console. You may hear a click as the radio tab locks into the bracket.


PSMELC65847AA

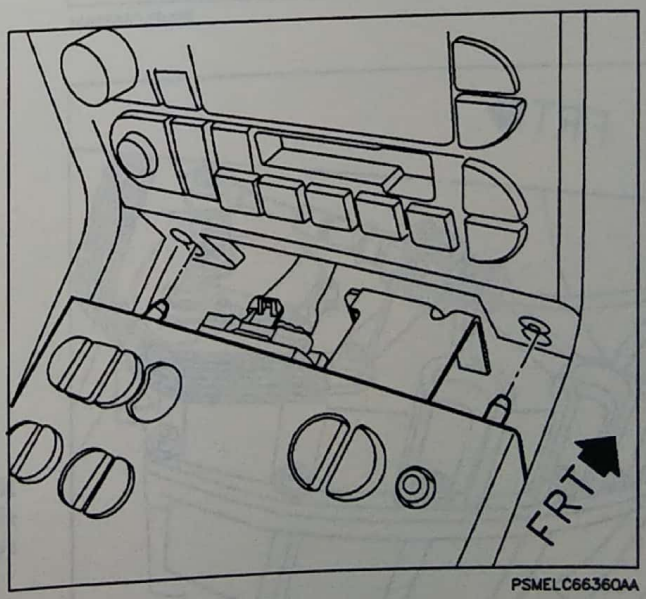
45. Cover the radio face with a rag for protection during RSA installation. Install shift cable housing into shift bracket and connect and secure shift cable to shifter. Be sure clip lock tab is in place.
46. Connect wire harness connector to RSA.
47. Align RSA locator tabs to front of instrument panel and push down on the rear of the RSA.
48. Install TORX™ fasteners.

Torque: 6 N•m (53 in–lbs)

IMPORTANT: You must adjust shift cable at final drive unit.

49. Adjust shift cable:

IMPORTANT: The shift cable must be attached to the RSA with the RSA secured in position. Shift handle must be placed in neutral before cable adjustment is performed.



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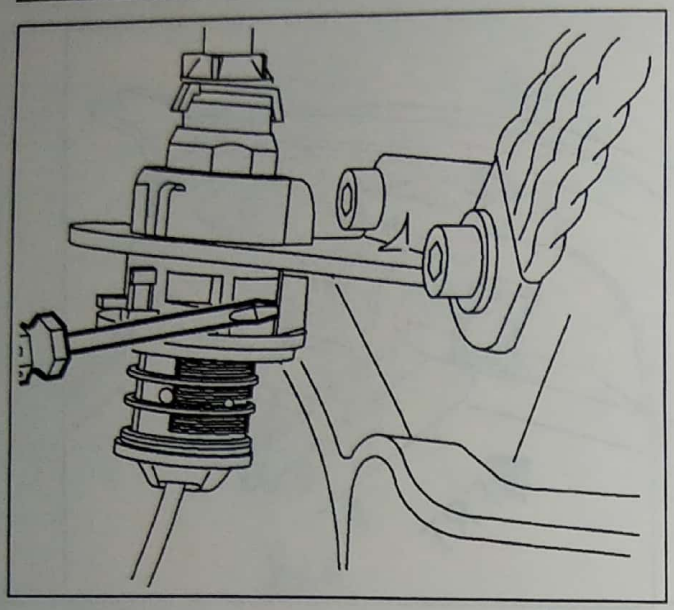
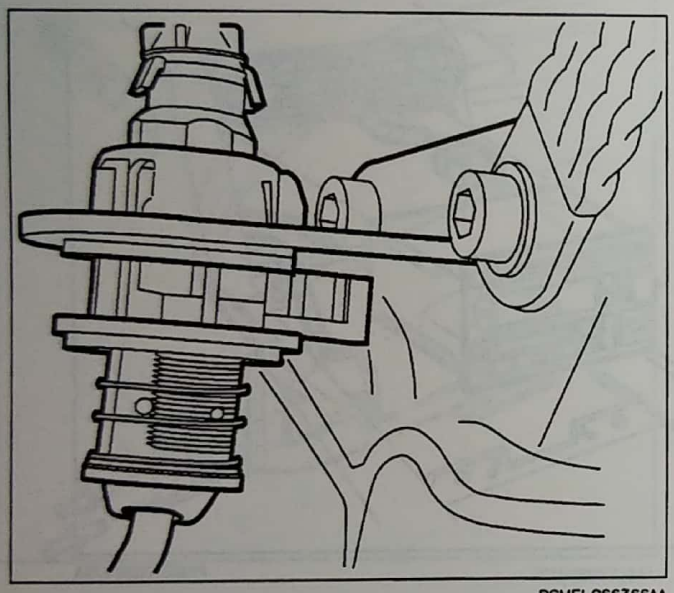


PSMELC66365AA

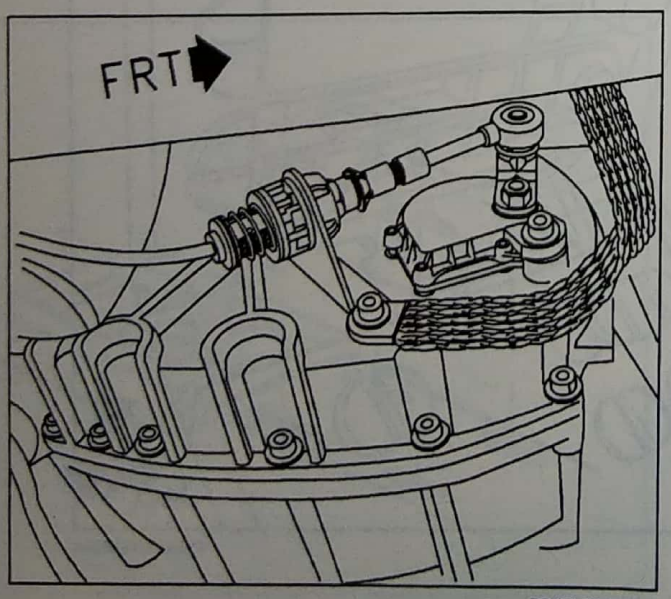
a. Remove underbody front air deflector assembly. (Refer to "Underbody Front Air Deflector Assembly" in the "Body/Repair Service Manual.")

b. Unlock U-shaped adjustment collar. Collar is located aft of drive unit bracket, and will unlock by inserting a pocket screwdriver into gap and prying towards drive unit.



PSMELC66366AA

IMPORTANT: About 13mm (1/2 in.) movement necessary to insure unlock position.



PSMELC66364AA

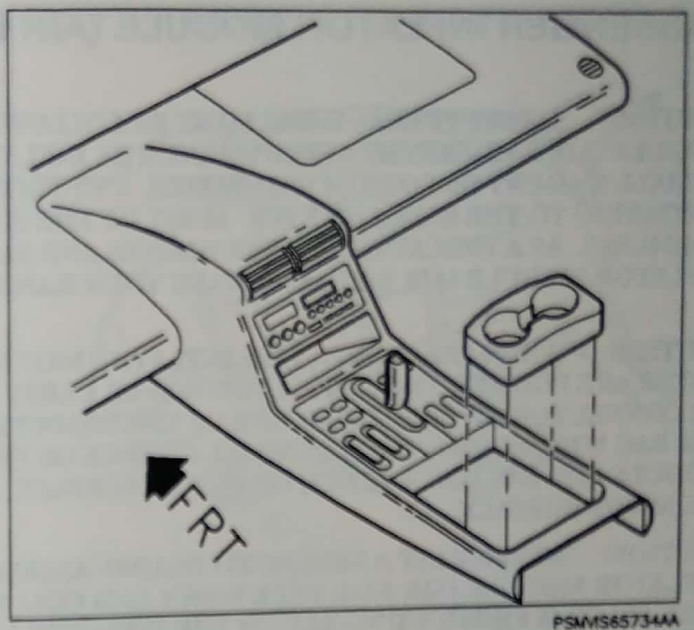
c. Verify shift lever is in neutral. Push U-shaped collar into lock position. Collar will move to right side of vehicle.

d. By hand shift park/lock lever to the full counterclockwise position (DRIVE) then move one detent in the clockwise direction (NEUTRAL).

e. Install underbody front air deflector assembly. (Refer to "Underbody Front Air Deflector Assembly" in the "Body/Repair Service Manual."

NOTICE: If shift cable has been removed more than six times at either end, for any reason, the cable must be replaced.

50. Install cup holder to center console.



PSMMS65734AA

PASSENGER INFLATOR MODULE (AIR BAG)

CAUTION: SAFETY PRECAUTIONS MUST BE FOLLOWED WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG). AFTER DEPLOYMENT, THE INFLATOR MODULE (AIR BAG) SURFACE MAY CONTAIN A SMALL AMOUNT OF SODIUM HYDROXIDE, A BY-PRODUCT OF THE DEPLOYMENT REACTION, THAT IS IRRITATING TO THE SKIN AND EYES. MOST OF THE POWDER ON THE INFLATOR MODULE (AIR BAG) IS HARMLESS. AS A PRECAUTION, WEAR GLOVES AND SAFETY GLASSES WHEN HANDLING A DEPLOYED INFLATOR MODULE (AIR BAG), AND WASH YOUR HANDS WITH MILD SOAP AND WATER AFTERWARDS.

CAUTION: WHEN CARRYING A LIVE INFLATOR MODULE (AIR BAG), MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. NEVER CARRY INFLATOR MODULE (AIR BAG) BY THE WIRES OR CONNECTOR ON THE UNDERSIDE OF THE MODULE. IN CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG WILL DEPLOY WITH MINIMAL CHANCE OF INJURY. WHEN PLACING A LIVE INFLATOR MODULE (AIR BAG) ON A BENCH OR OTHER SURFACE, ALWAYS FACE BAG AND TRIM COVER UP, AWAY FROM THE SURFACE.

CAUTION: NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE INFLATOR MODULE (AIR BAG) FACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE INFLATOR MODULE (AIR BAG) TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY COULD RESULT.

IMPORTANT: In the event deployment has occurred, refer to "Repairs and Inspections Required After an Accident" in this service manual.

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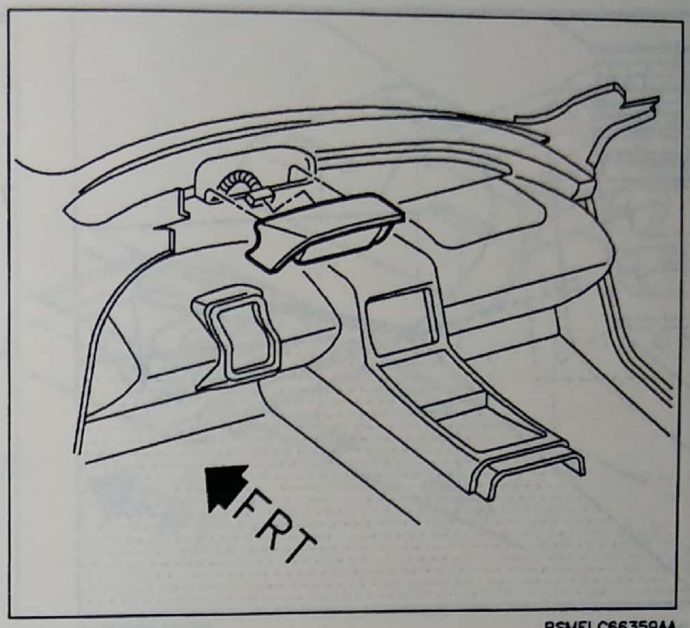
PASSENGER SIDE INFLATOR MODULE AND INSTRUMENT PANEL PASSENGER KNEE BOLSTER REINFORCEMENT

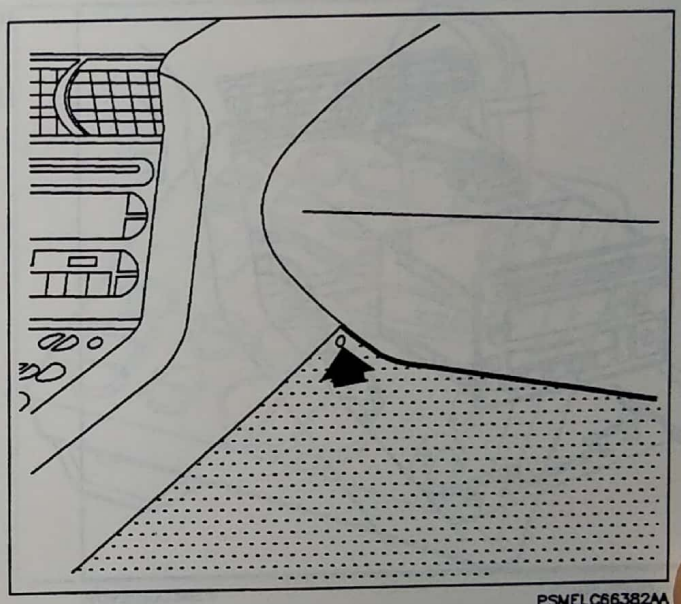
REMOVAL

1. Disable the SIR system. (Refer to "Disabling the SIR System" in this manual.)
2. Remove instrument panel cluster (IPC) by lifting upward and rearward, disconnect the IPC connector.

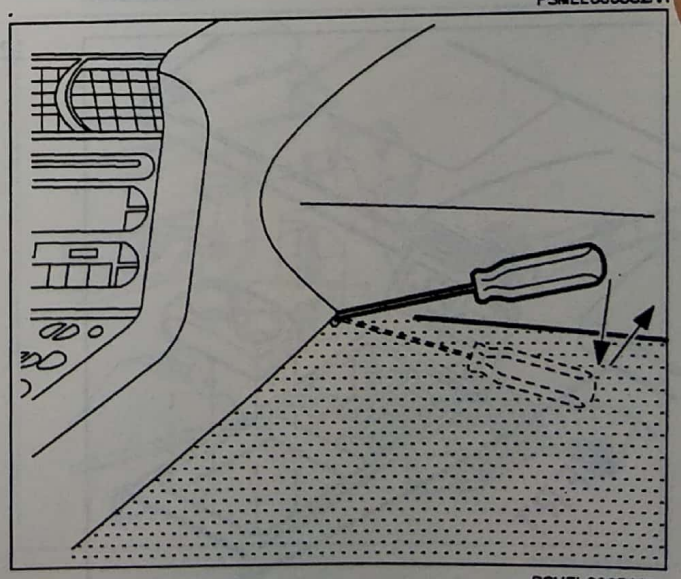


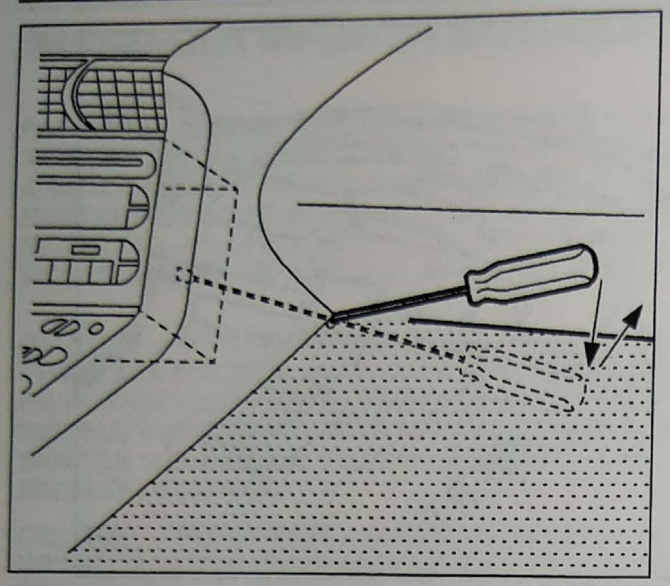
PSMELC66359AA

3. Locate hole in instrument panel tunnel bracket on right side behind carpet.
4. Use a knife to make a small slit in carpet over the hole.


PSMELC66382AA

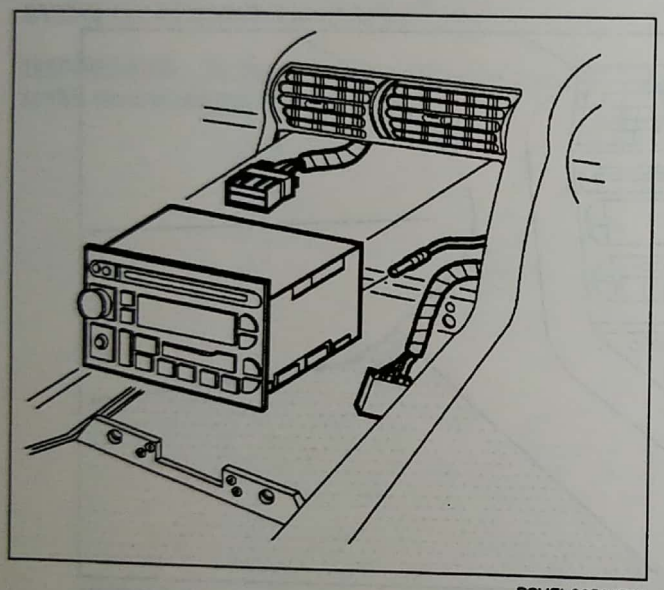
5. Insert a screwdriver with a blade about 152–304 mm (6 – 12 in.) long into the hole in the instrument panel tunnel bracket. Slide screwdriver along instrument panel radio bracket until the screwdriver is wedged between bracket and the radio lock tab. The screwdriver should be inserted about 152 mm (6 in.).


PSMELC66383AA



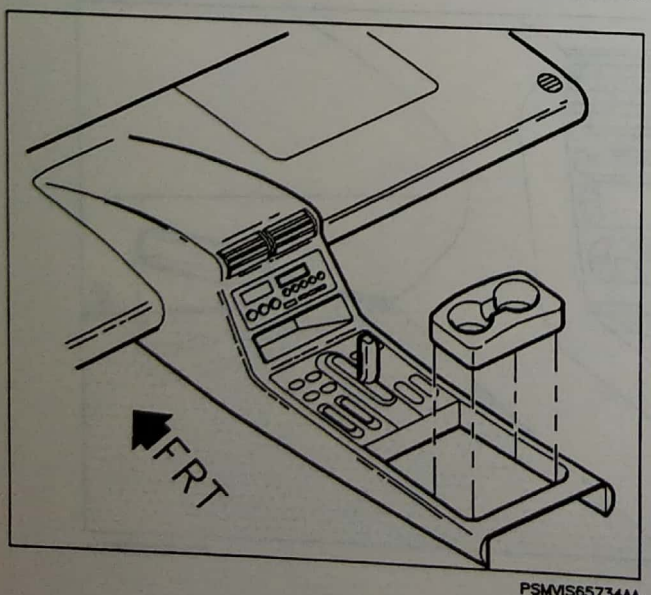
PSMELC66837AA

6. Push downward then forward on the screwdriver handle, lifting the lock tab upward and the radio rearward simultaneously. The radio should move rearward enough so that it can be pulled out the rest of the way by hand.
7. With the brake applied, shift run/lock shift assembly (RSA) to DRIVE, then select ACCY mode to shut Off power and apply the parking brake to keep the vehicle from rolling unexpectedly.
8. Lay a clean shop rag over the RSA to help protect it from getting scratched by the radio case during radio removal.
9. Slide radio out of instrument panel.



PSMELC65847AA

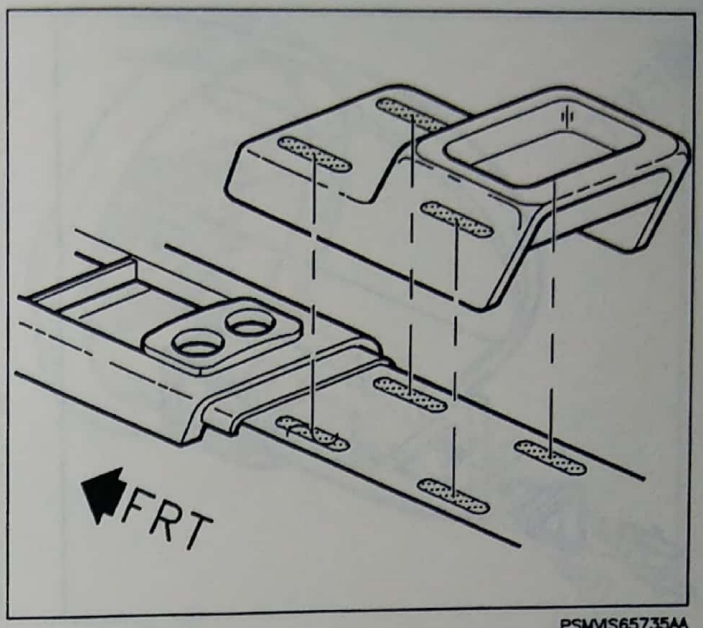
10. Disconnect the antenna lead first, then the harness connector.
11. With the brake applied, select the RUN mode again, and shift back to PARK. Then select the LOCK mode to turn the vehicle Off.



PSMMS65734AA

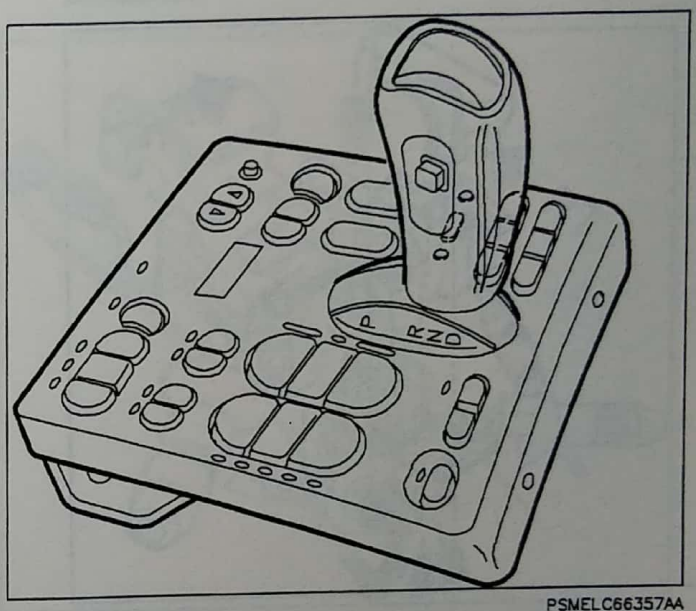
12. Remove cup holder.

13. Remove arm rest from tunnel by lifting upward releasing Dual-Lock retainers.



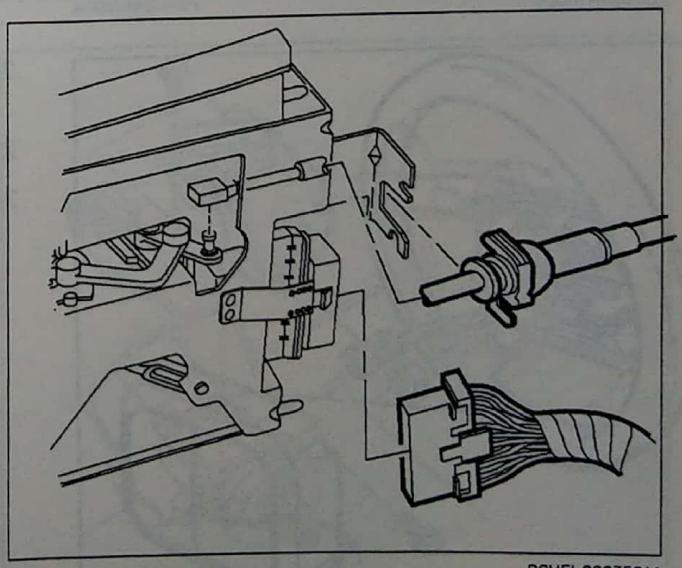
PSMMS65735AA

14. Remove the T–25 TORX™ screws in the rear of the RSA, pull RSA rearward about 63 mm (2.5 in.).



PSMELC66357AA

15. Rotate RSA towards the drivers side of the vehicle to a 45 degree angle.
16. Disconnect the RSA wire harness connector.
17. Disconnect the shift cable from the shifter and remove shift cable from retainer bracket by prying locking tab on drivers side of RSA gently and pushing cable down out of bracket.



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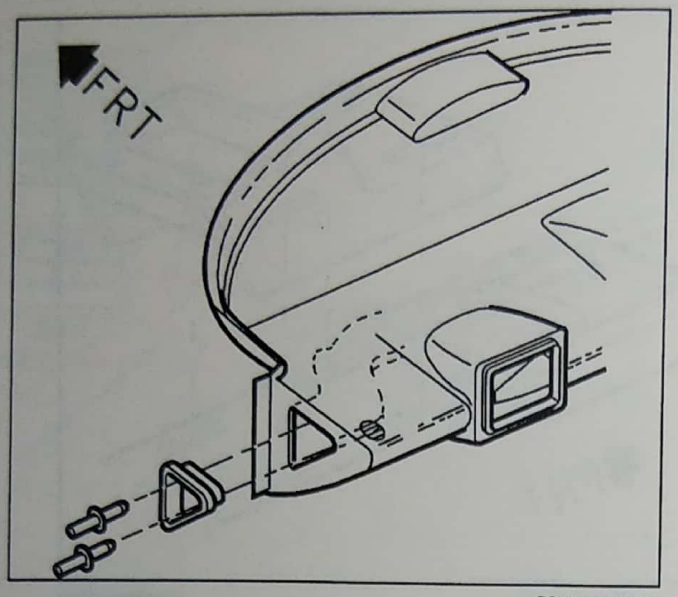
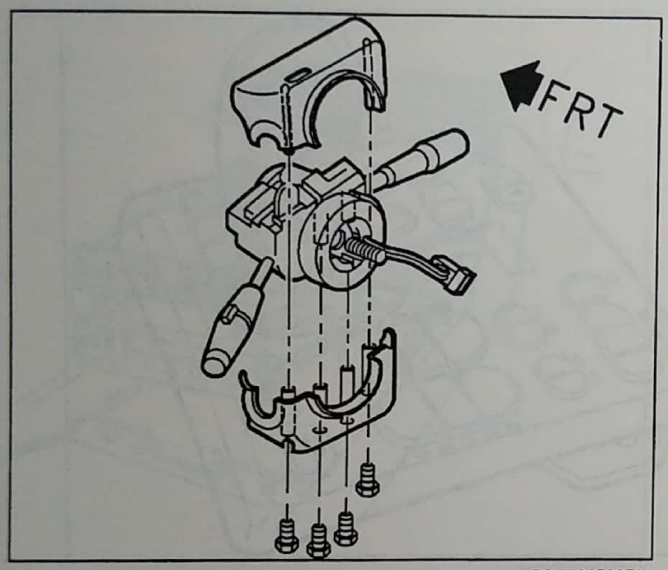


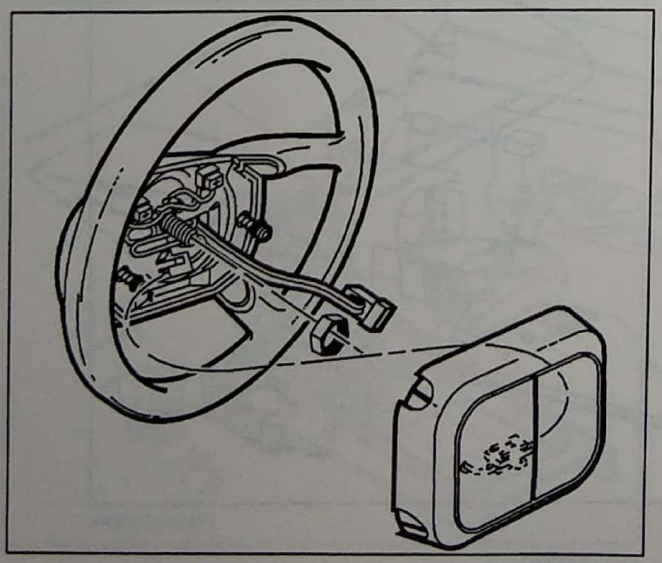
PSMVIS65736AA

18. Drill out rivets from side door air outlets.
19. Remove left and right front side door air outlets on the side of instrument panel with doors open.



PSMVIS65827AA

20. Remove outer screws from lower steering column trim cover, left upper trim panel off.
21. Remove inner screws from lower steering column trim cover and remove lower trim cover.



PSMVIS65863AA

22. Remove screws from back of steering wheel that retains SIR inflator module.
23. Disconnect SIR inflator module connector
24. Remove SIR inflator module.

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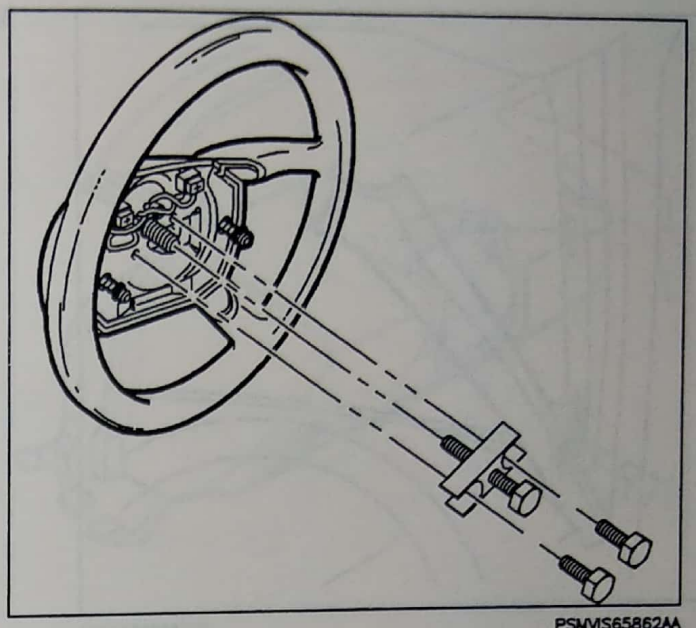
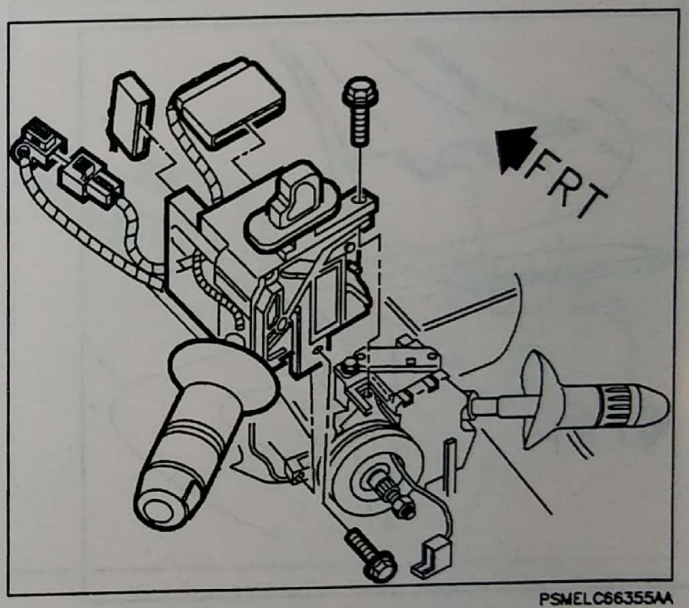
25. Disconnect horn switch connector.
26. Remove nut from steering column that retains steering wheel.
27. Install steering wheel puller SA9218NE and remove steering wheel.



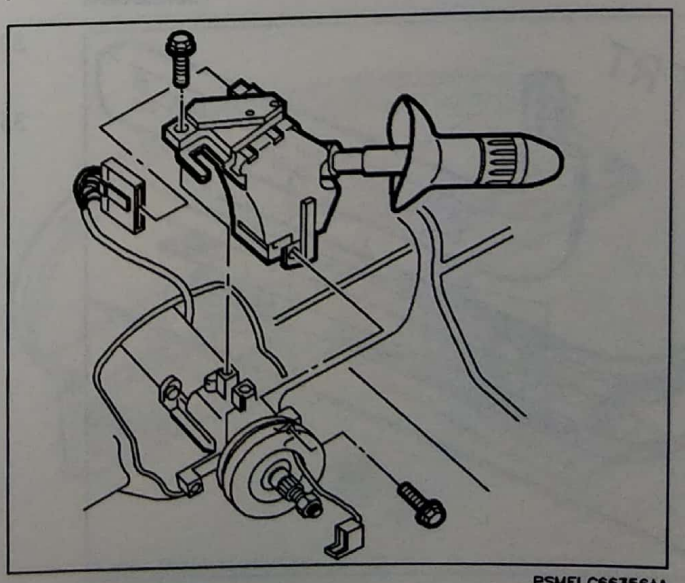
PSMIS65862AA

28. Remove T–25 TORX™ /7 mm screws from turn signal, headlamp and cruise switch.
29. Remove switch and disconnect switch connectors.

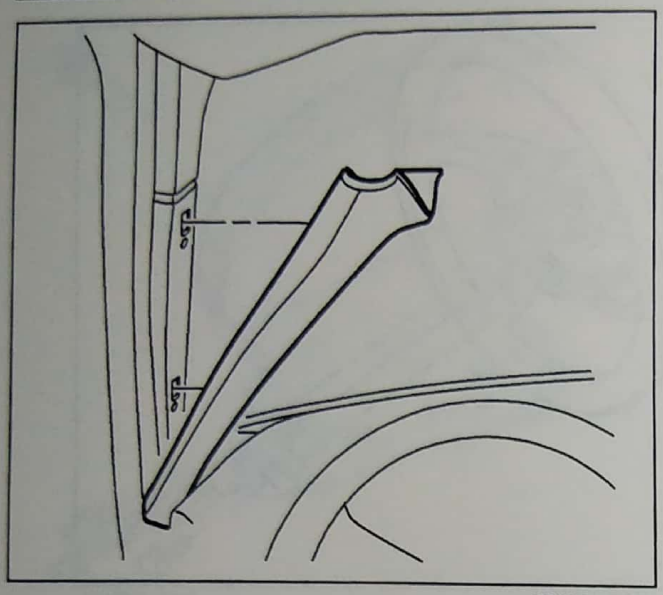


PSMELC66355AA

30. Remove T–25 TORX™ /7mm screws from windshield washer switch.
31. Disconnect connector and remove switch.

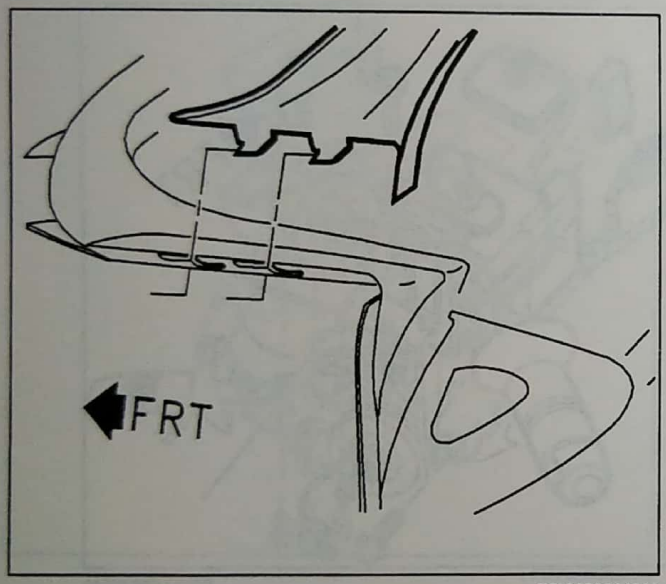


PSMELC66356AA



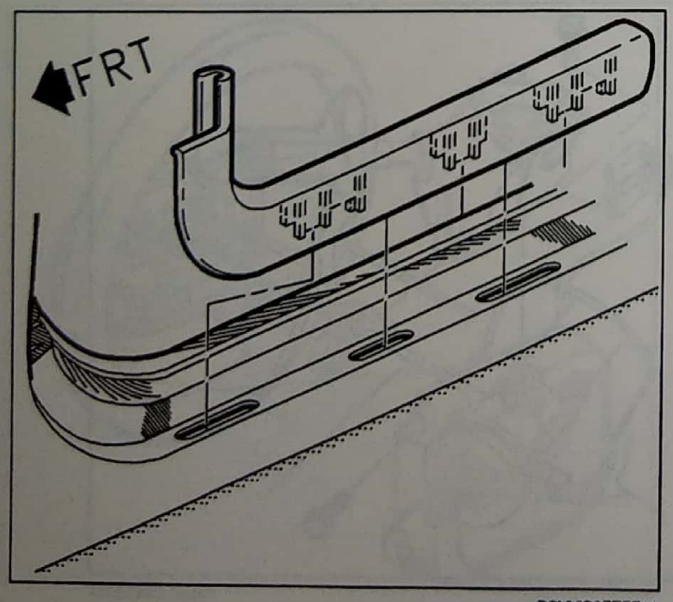
PSMMS66447AB

32. Starting at top of garnish molding, pull firmly at clip locations to disengage. Tipping the top molding inward with the bottom engaged to instrument panel.



PSMMS66448AA

33. Disengage tabs on garnish molding from instrument panel by pulling rearward and inboard.



PSMMS65733AA

34. Starting at rear of carpet retainer, pull firmly on carpet retainer at clip locations to disengage clips.
35. Remove front side door opening floor carpet retainer.

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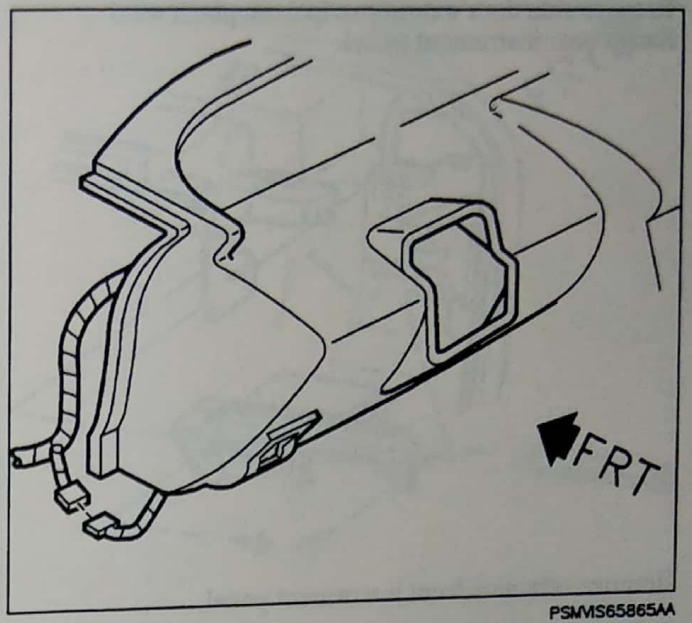
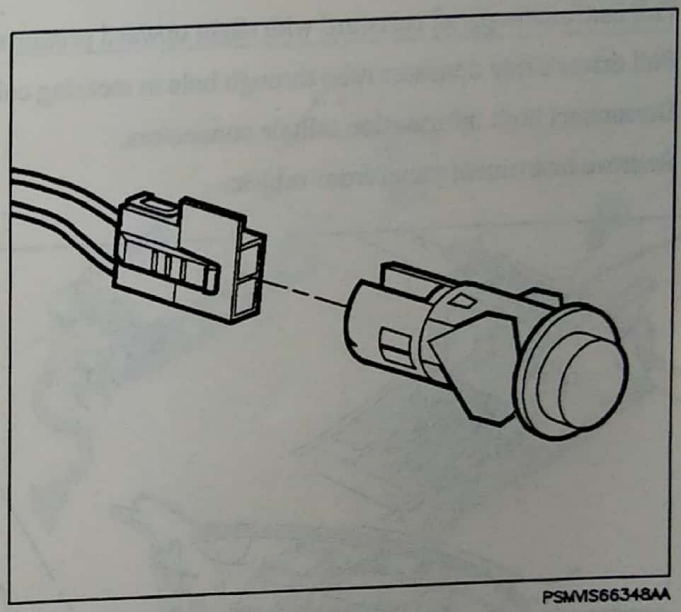
36. Disconnect parking brake switch connector.



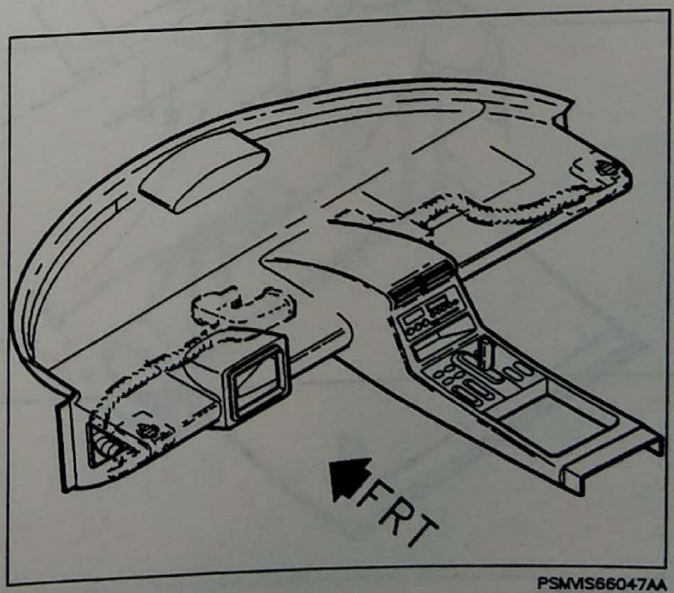
PSMIS65865AA

37. Disconnect auxiliary battery recovery switch connector.



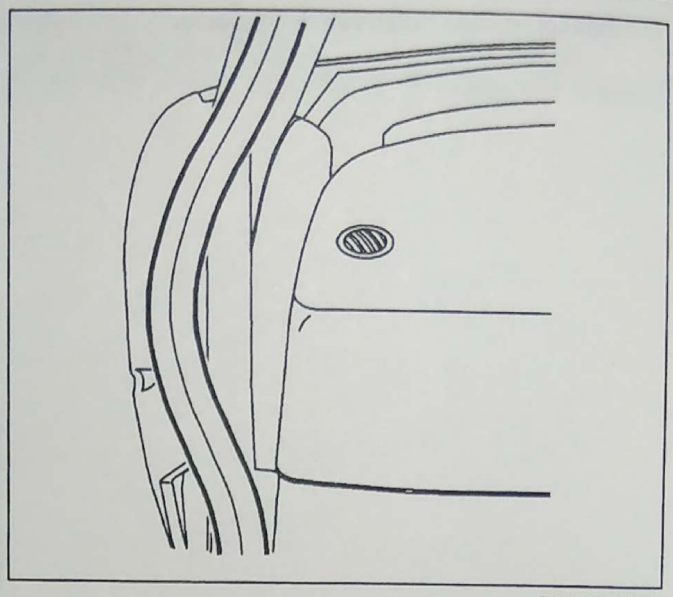
PSMIS66348AA

38. Disconnect side window demistor tubes from floor outlets.



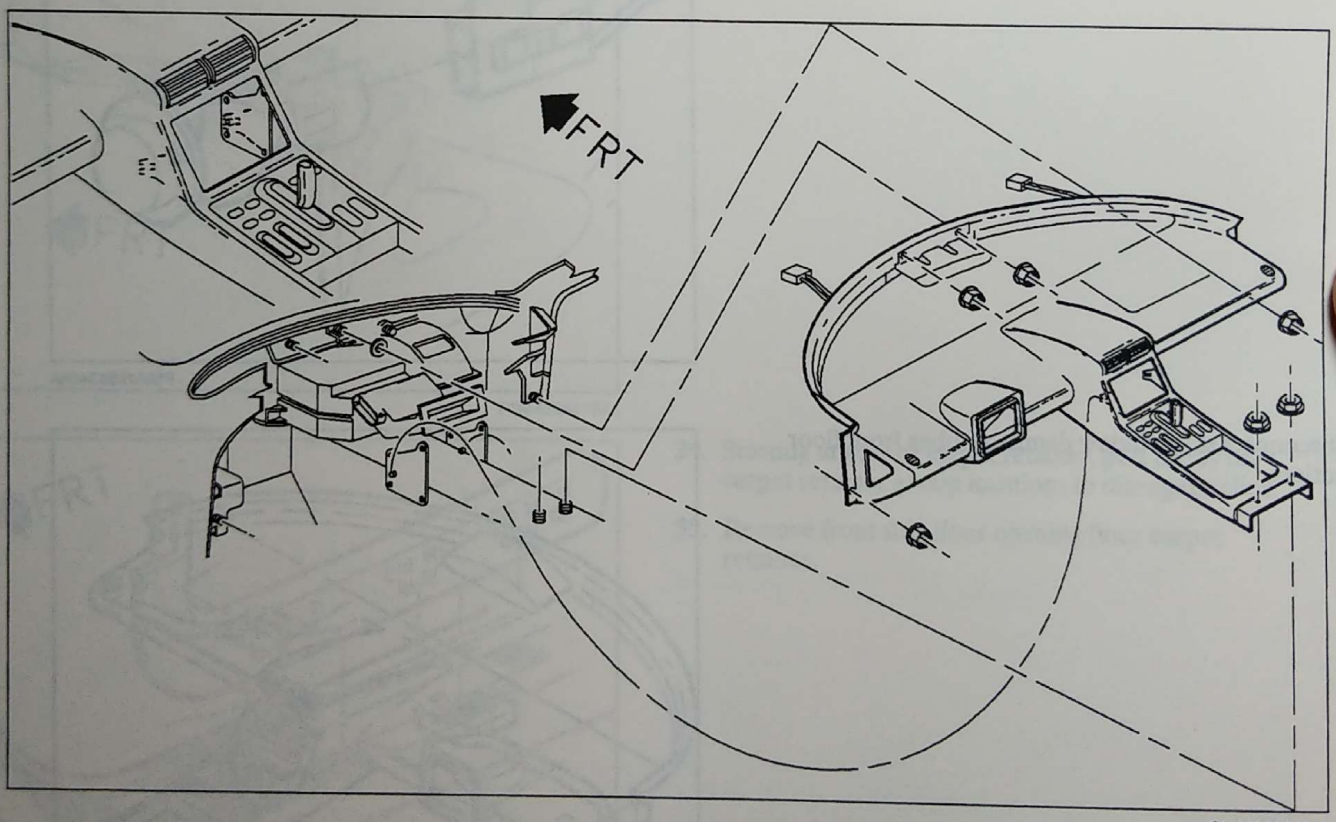
PSMIS66047AA

39. Remove side door weather strip from pinch weld flange near instrument panel.



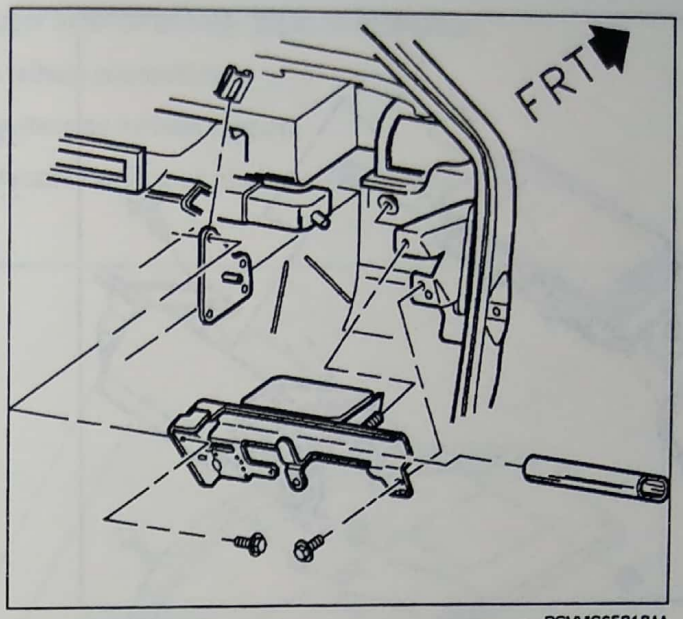
PSMVIS66337AA

40. Remove retainers from instrument panel.
41. Pull instrument panel rearward with slight upward pressure.
42. Pull driver's side demister tube through hole in steering column support.
43. Disconnect both information telltale connectors.
44. Remove instrument panel from vehicle.



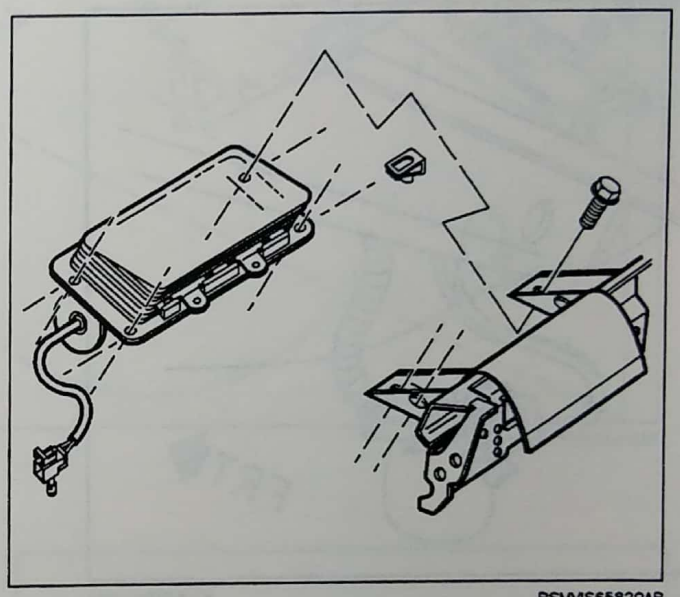
PSMVIS66048AA

45. Remove passenger side HVAC outer air duct.
46. Disconnect cross car wiring harness rose buds from instrument panel knee bolster reinforcement.
47. Remove bolts and nuts from instrument panel knee bolster reinforcement.
48. Remove instrument panel knee bolster reinforcement.



PSMMS65818AA

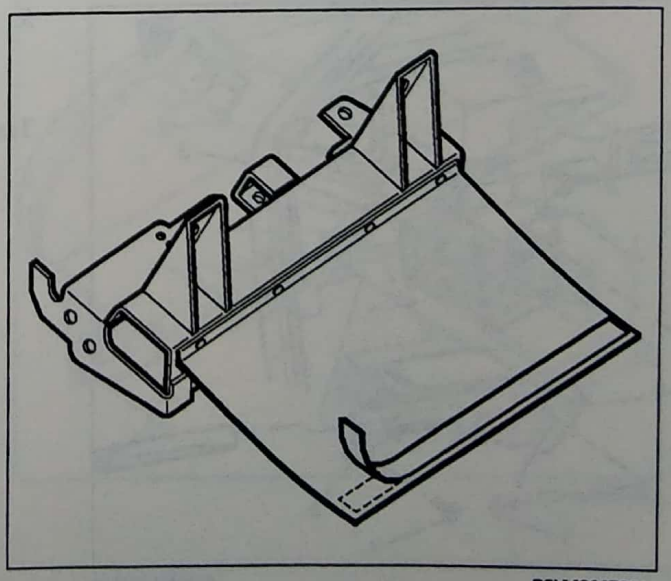
49. Disconnect SIR inflator module wire harness retainer from knee bolster reinforcement.
50. Remove SIR inflator module guidance shute from inflator module.
51. Remove bolts from passenger side inflator module to knee bolster reinforcement.



PSMMS65820AB

INSTALLATION

1. Clean double side tape off of guidance shute and SIR inflator module if reused. Install new tape on guidance shute.



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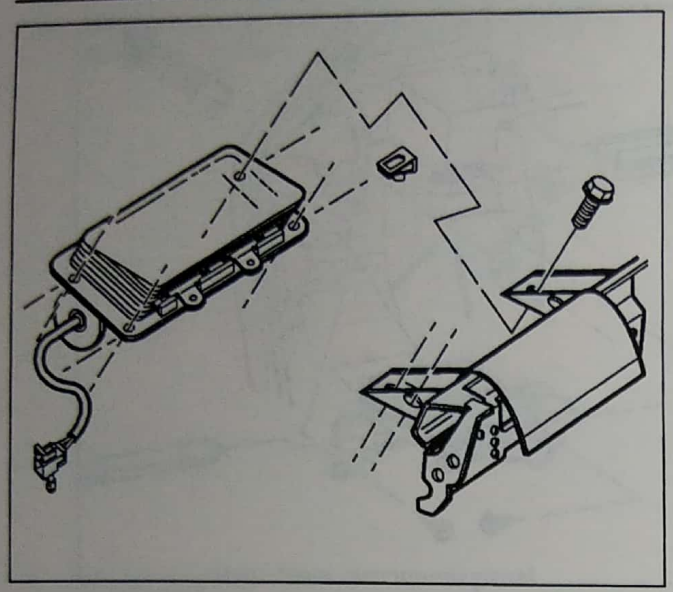
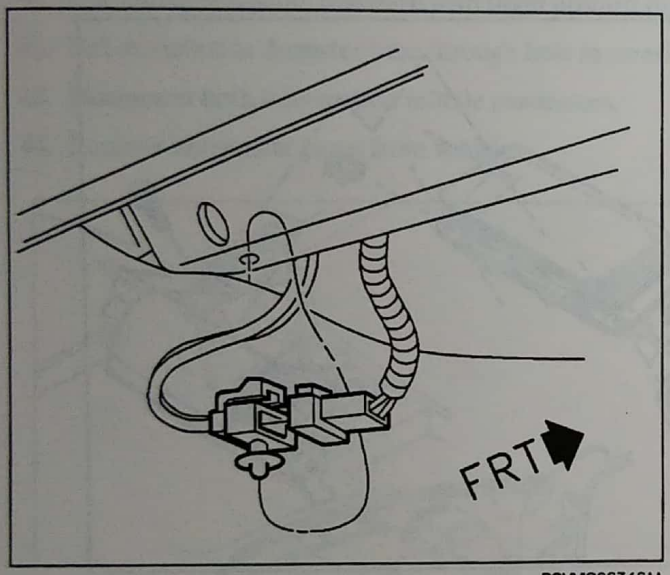


PSMMS65820AB

2. Install nuts onto SIR inflator module. Install SIR inflator module to knee bolster reinforcement with bolts.

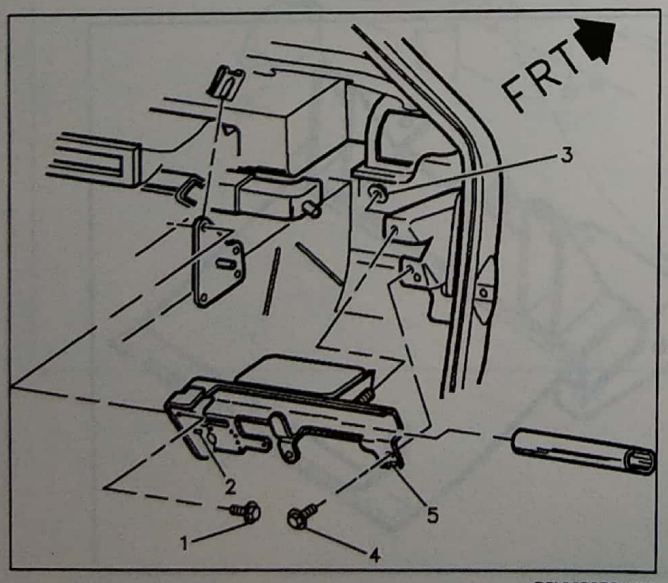
Torque: 10 N•m (7 ft−lbs)

3. Peel backing off of double sided tape and stick to leading edge of SIR inflator module.



PSMMS66346AA

4. Install SIR inflator module wire harness retainer to knee bolster reinforcement.



PSMMS65819AA

5. Install instrument panel knee bolster reinforcement to space frame. Install bolts and nut. Torque in sequence as shown.

Torque: 33 N•m (24 ft−lbs)

6. Install passenger side HVAC outer air duct into knee bolster reinforcement and seat into heat pump ventilation module. Insert cross car wire harness rose buds into instrument panel knee bolster reinforcement.

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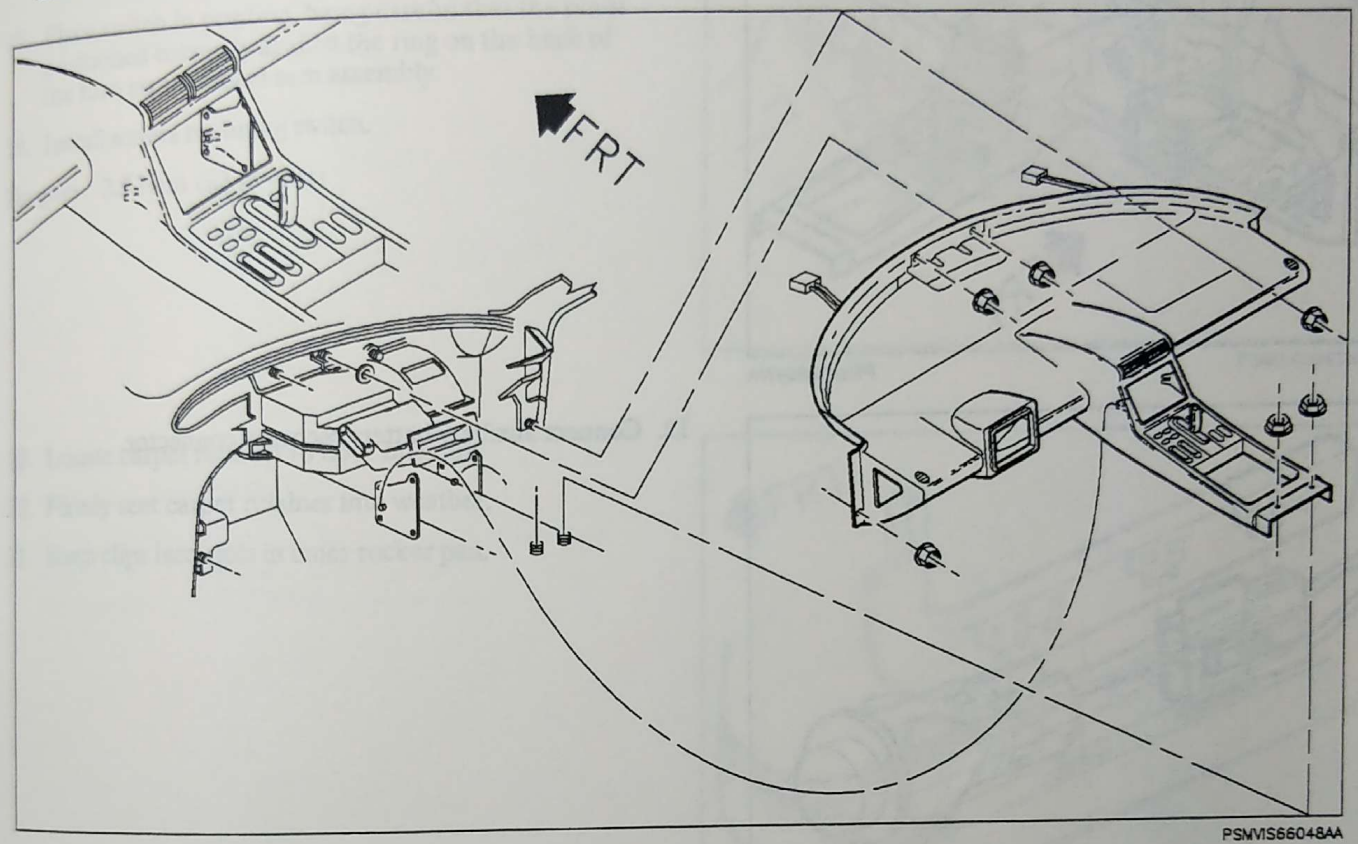
IMPORTANT: Before assembling make sure spacer is in proper location to body. Refer to illustration.

7. Set instrument panel in location and connect information telltale connectors.
8. Guide driver's side demister tube into and through hole in steering column support.
9. Install instrument panel over studs on front of dash. The tunnel has locator pins on either side of which the instrument panel has to be located on when installing.



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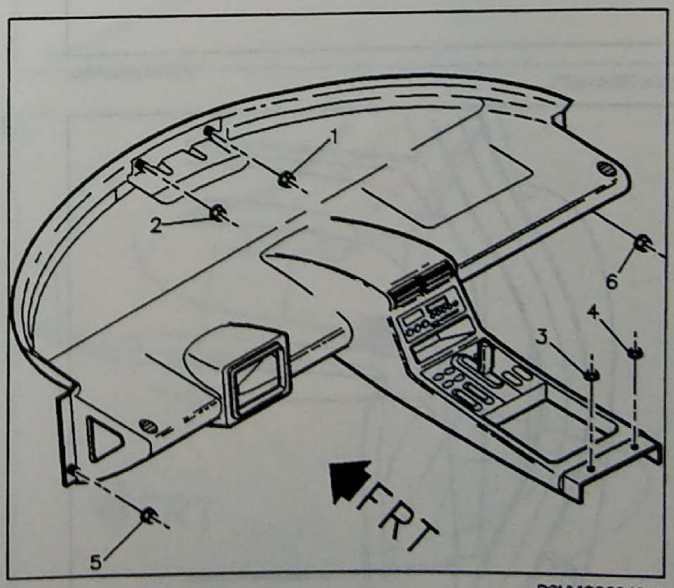
10. Secure instrument panel fasteners. Torque in sequence shown.

Torque: 5 N•m (44 in–lbs)



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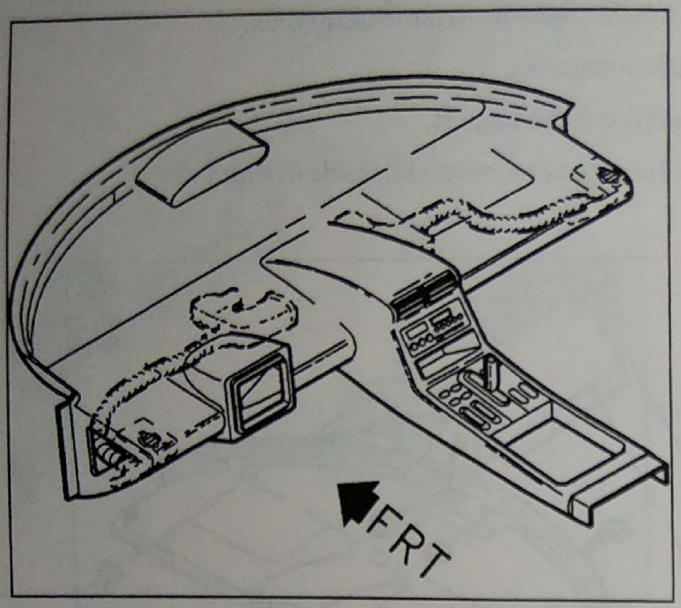
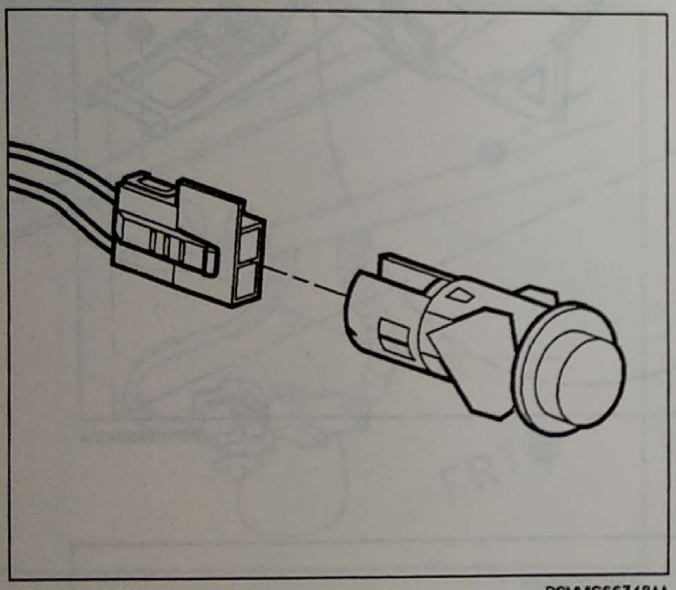


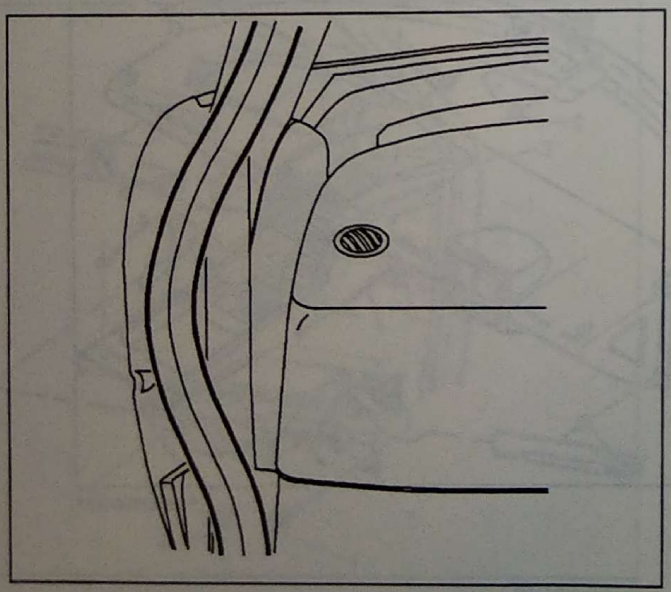
PSMMS66047AA

11. Connect side window demister tubes to floor outlets.



PSMMS66348AA

12. Connect auxiliary battery recovery connector.



PSMMS66337AA

13. Install side door weatherstrip onto pinch weld flange near instrument panel.

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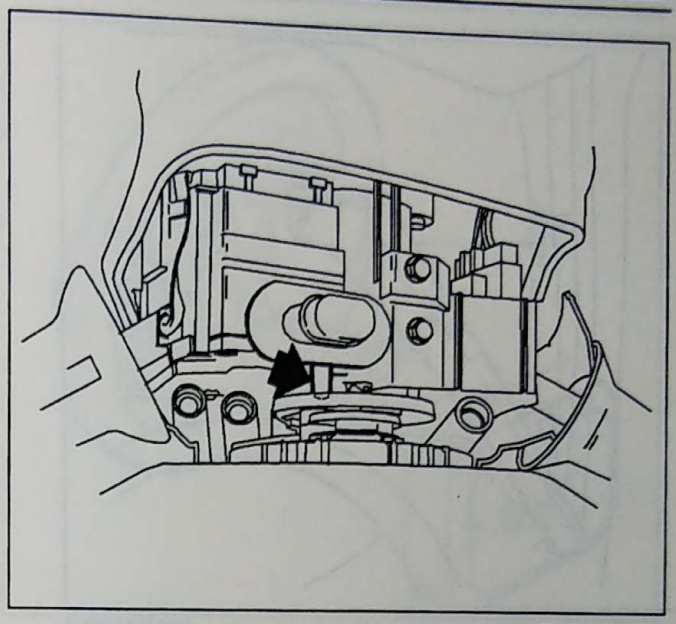
14. Connect connector to windshield washer switch.
15. Install screws retaining switch.

Torque: 2.5 N•m (22 in−lbs)

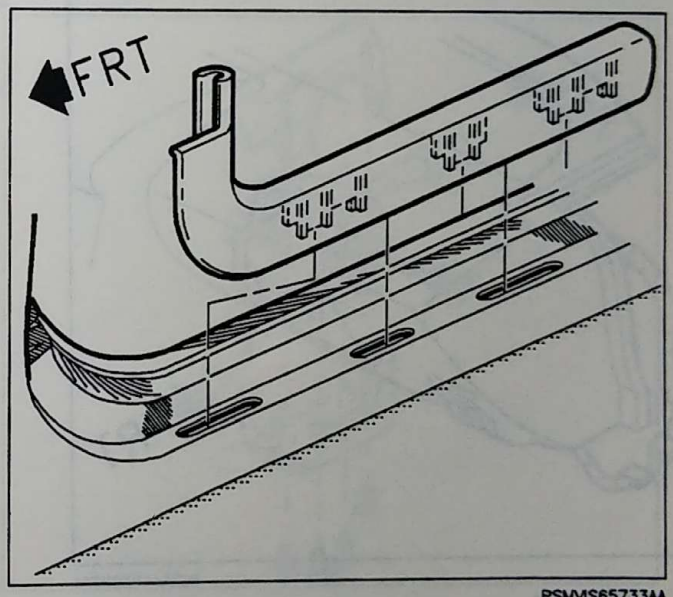
16. Connect connectors to turn signal, headlamp, and cruise switch.
17. Place switch in position, being careful that the pin is positioned correctly against the ring on the back of the turn signal cancel cam assembly.
18. Install screws retaining switch.

Torque: 2.5 N•m (22 in−lbs)



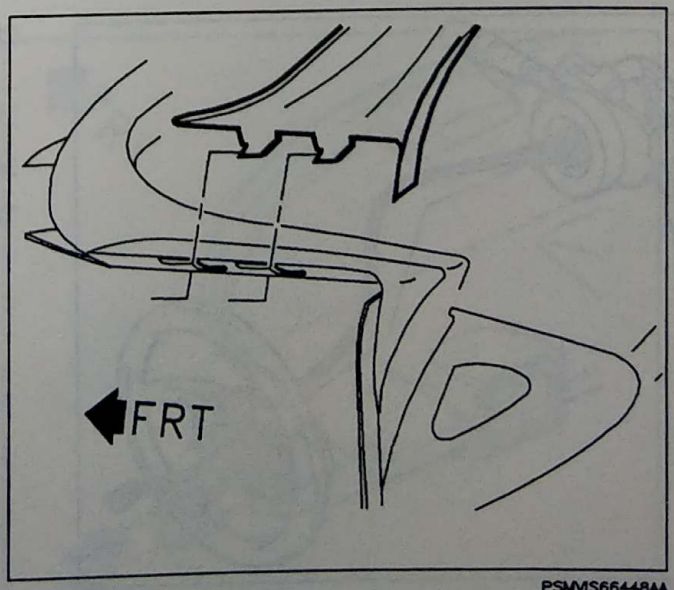
PSMELC66439AA

19. Locate carpet retainer to door opening.
20. Firmly seat carpet retainer into weather.
21. Snap clips into slots in inner rocker pan.



PSMVIS65733AA

22. Insert tabs on bottom of garnish molding into instrument panel.
23. Push molding downward and forward past A-pillar structure.



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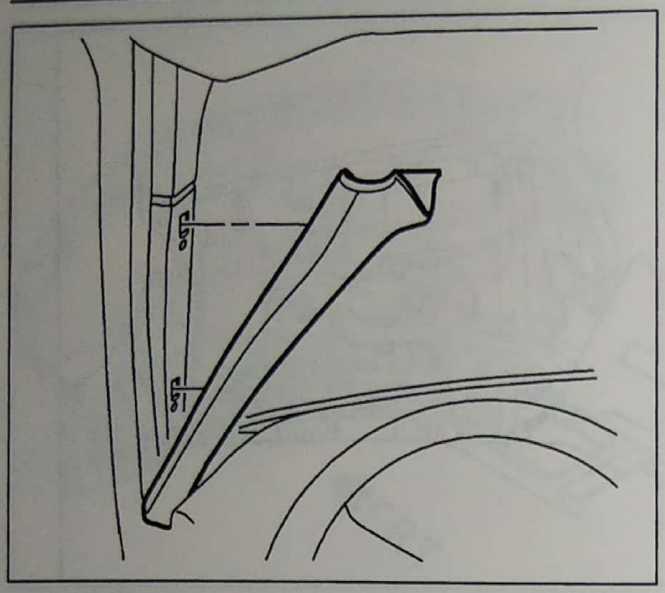
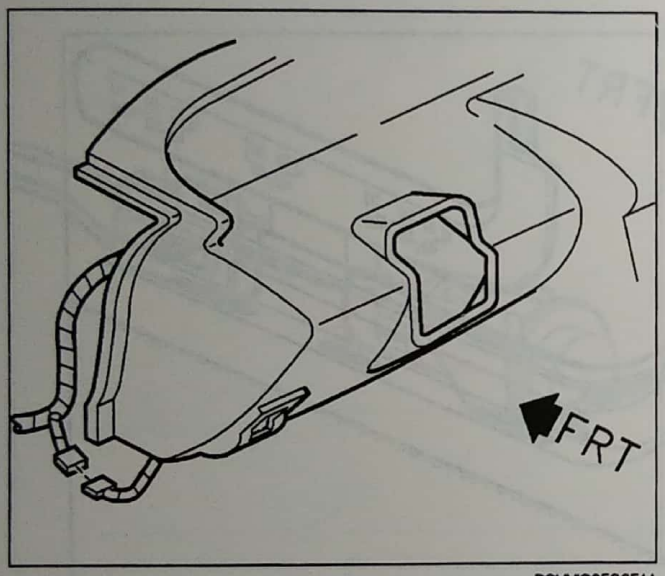


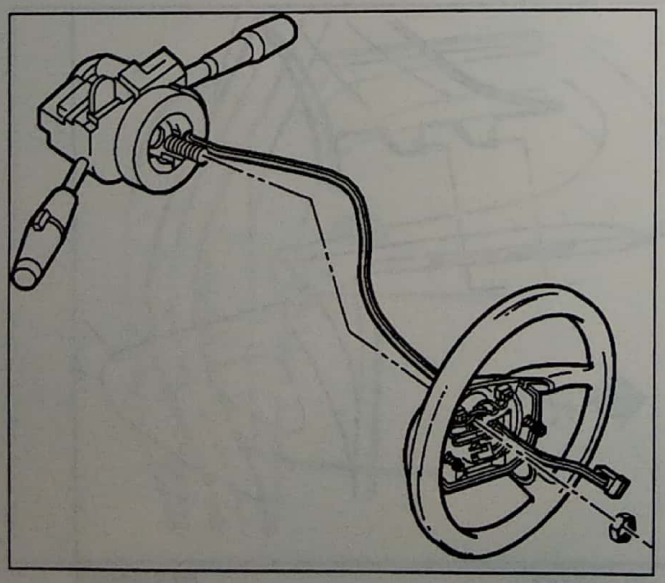
PSMMS66447AB

24. Push molding to structure pressing forward and outward to insure proper fit to instrument panel, headlining and door seal.
25. Align clips on garnish molding to slots in A-pillar and press firmly at clip locations.
26. Position flap on door weatherstrip over windshield garnish molding.



PSMMS65865AA

27. Connect park brake switch connector.



PSMMS65864AA

28. Route SIR cable through steering wheel. Install steering wheel to column.
29. Connect horn wire connector.
30. Install steering wheel nut.

Torque: 42 N•m (31 ft−lbs)

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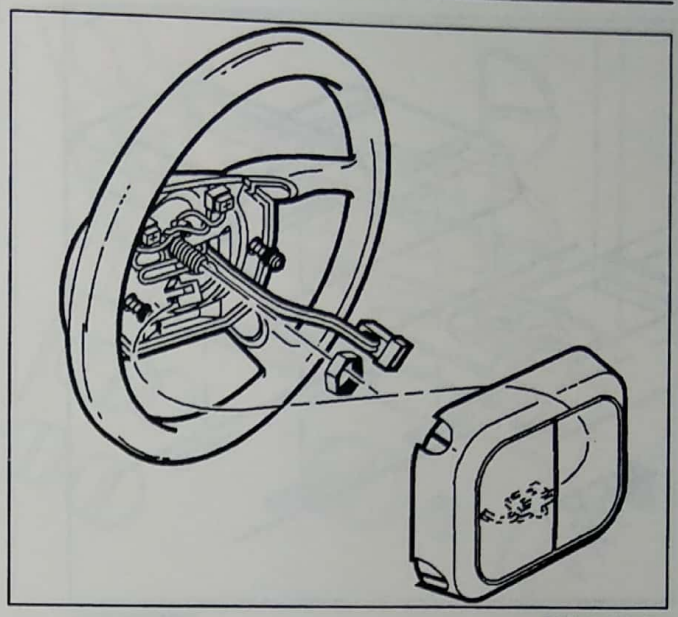
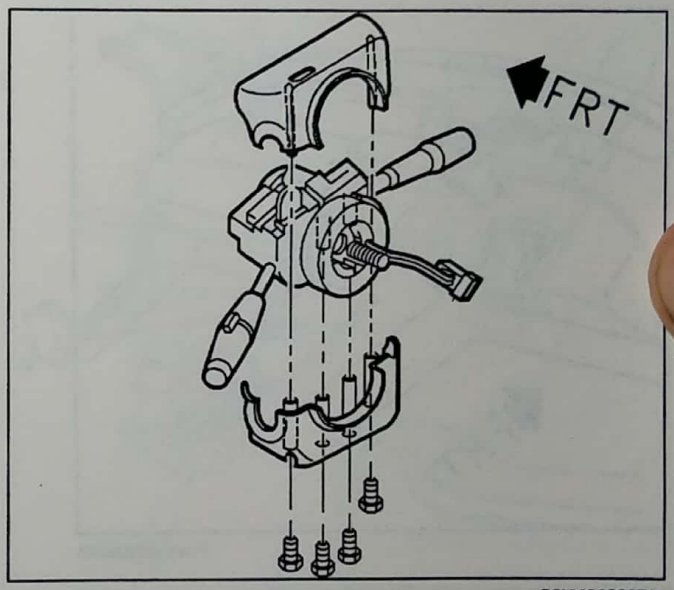
31. Route yellow SIR inflator module wire harness within the steering wheel hub forming an "S" shape with wire and connect SIR inflator module connector.
32. Install CPA, to connector.
33. Install inflator module to steering wheel.

Torque: 10 N•m (89 in−lbs)



PSMIS65863AA

34. Align lower steering column trim cover to steering column. Install and tighten inner screws.
35. Align upper steering column trim panel to steering column and install outer screws in lower steering column trim panel. Tighten outer screws.



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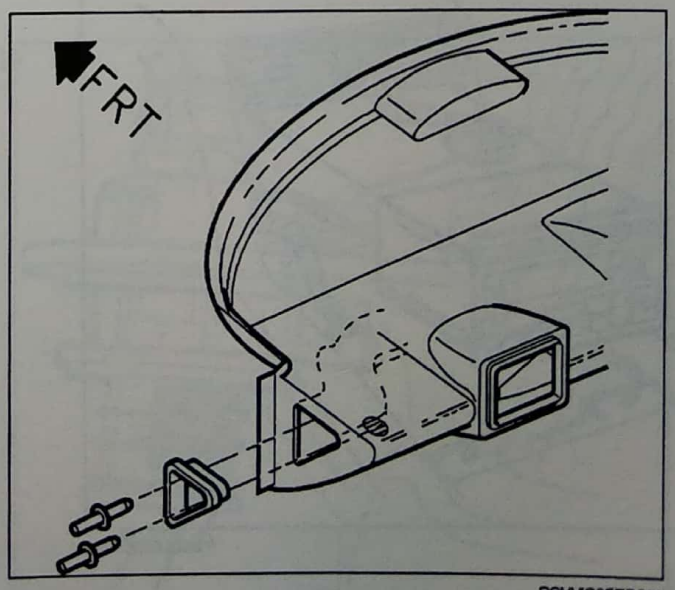
36. Install left and right front side door air outlets on side of the instrument panel using new fasteners.



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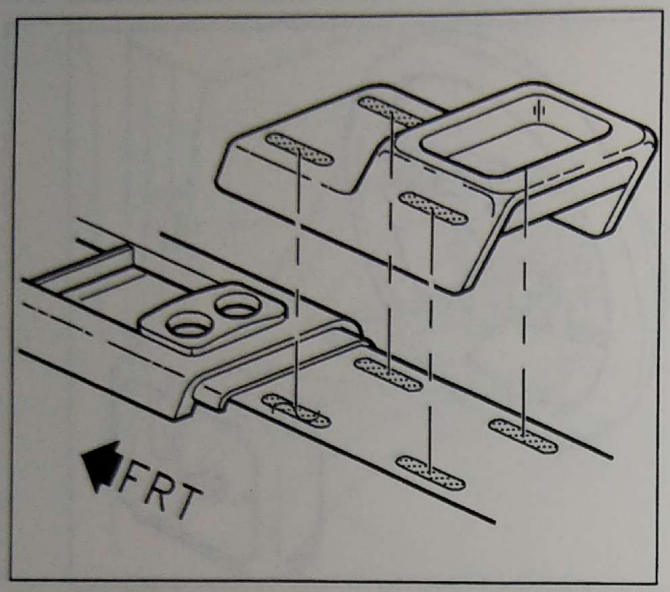

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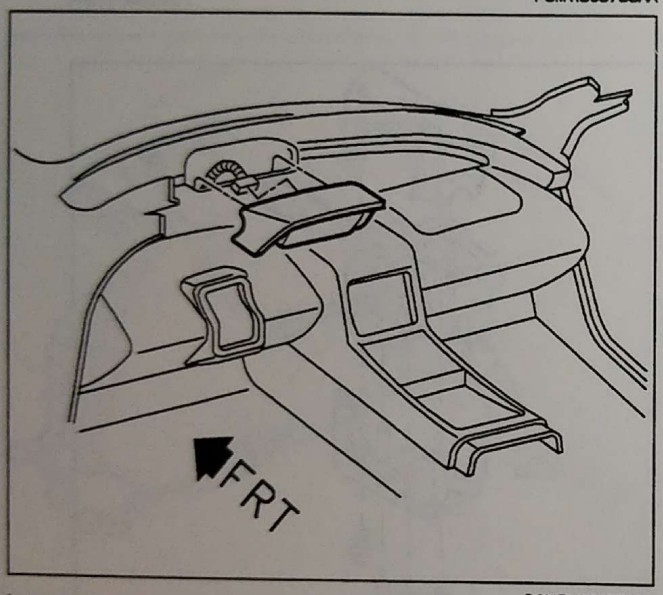
37. Install arm rest



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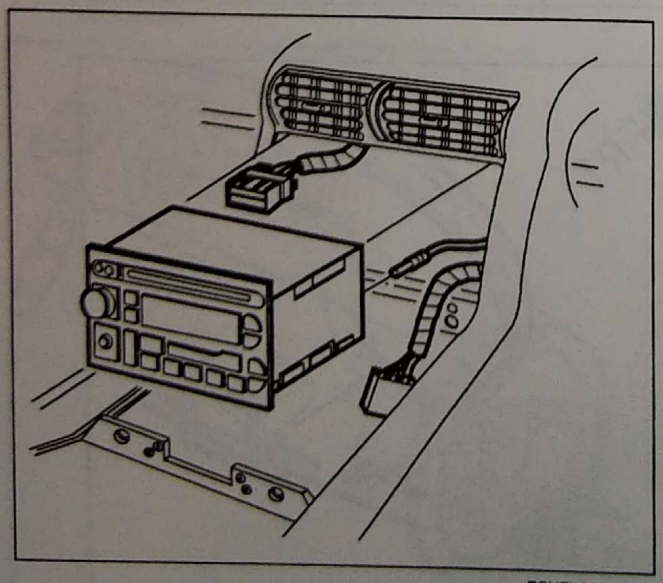
38. Push harness connector into socket on instrument panel cluster. Verify connection is made, seated and locked.
39. Install instrument panel cluster into instrument panel by pushing forward and downward.



PSMELC65847AA

40. Connect radio harness to radio, then antenna lead to radio. Verify both connections are seated properly.
41. Make sure antenna and harness are up and out of the way of the radio bracket. Slide radio into opening until the radio is seated and the radio fits tightly to the console. You may hear a click as the radio tab locks into the bracket.

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42. Cover the radio face with a rag for protection during RSA installation. Install shift cable housing into shift bracket and connect and secure shift cable to shifter. Be sure clip lock tab is in place.
43. Connect wire harness connector to RSA.
44. Align RSA locator tabs to front of instrument panel and push down on the rear of the RSA.
45. Install torx fasteners.

Torque: 6 N•m (53 in−lbs)

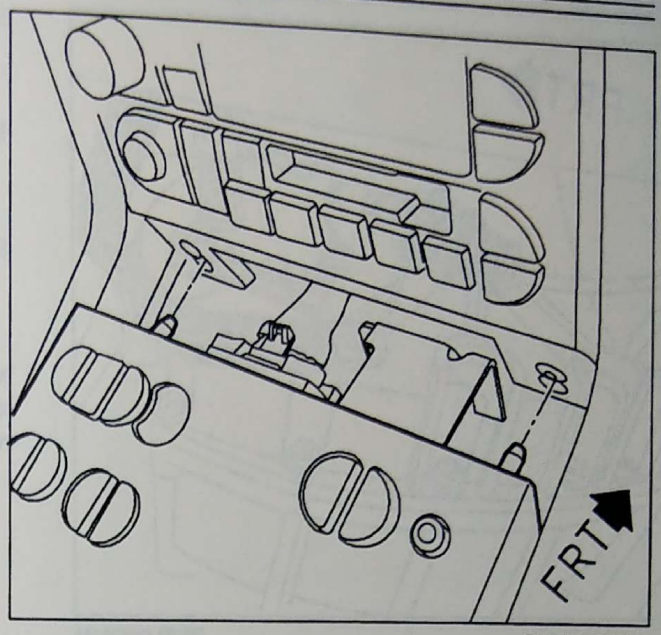
IMPORTANT: You must adjust shift cable at final drive unit.

46. Adjust shift cable:

IMPORTANT: The shift cable must be attached to the RSA with the RSA secured in position. Shift handle must be placed in neutral before cable adjustment is performed.

a. Remove underbody front air deflector assembly. (Refer to "Underbody Front Air Deflector Assembly" in the "Body/Repair Service Manual.")

b. Unlock U-shaped adjustment collar. Collar is located aft of drive unit bracket, and will unlock by inserting a pocket screwdriver into gap and prying towards drive unit.



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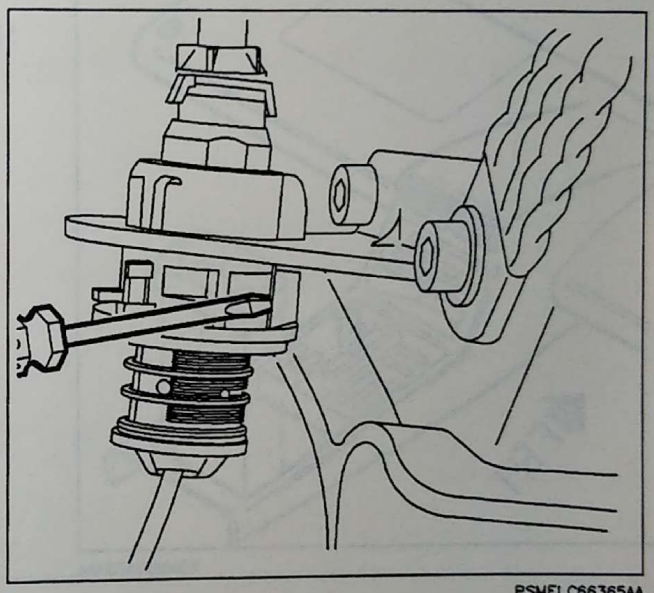
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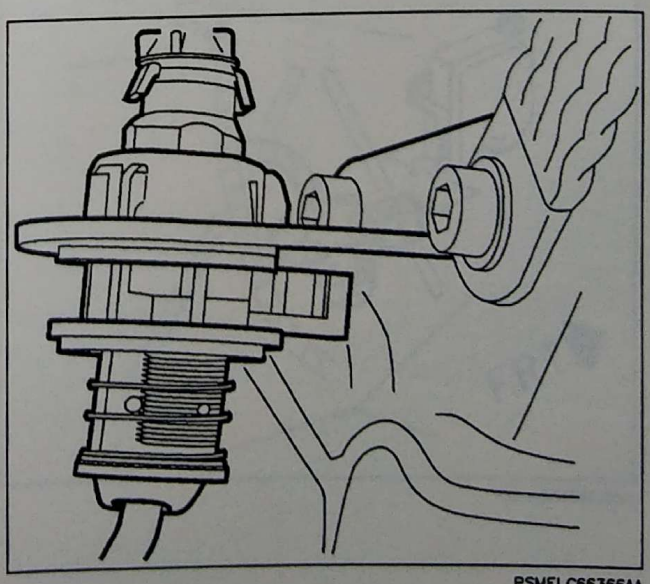
IMPORTANT: About 13 mm (1/2 in.) movement necessary to insure unlock position.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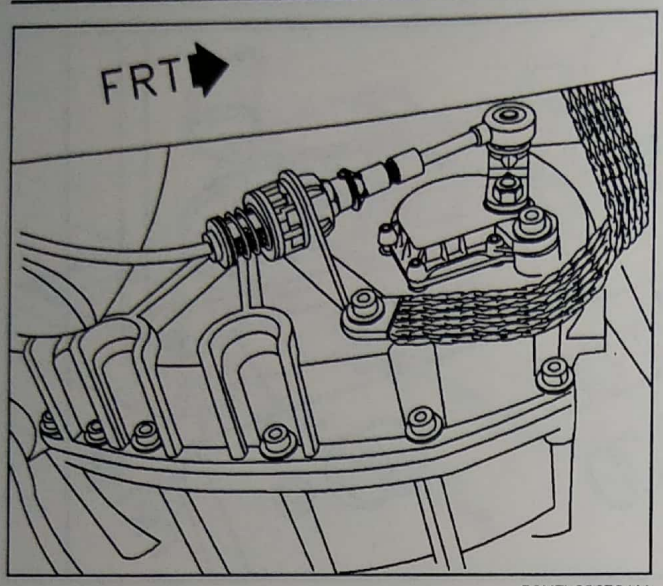

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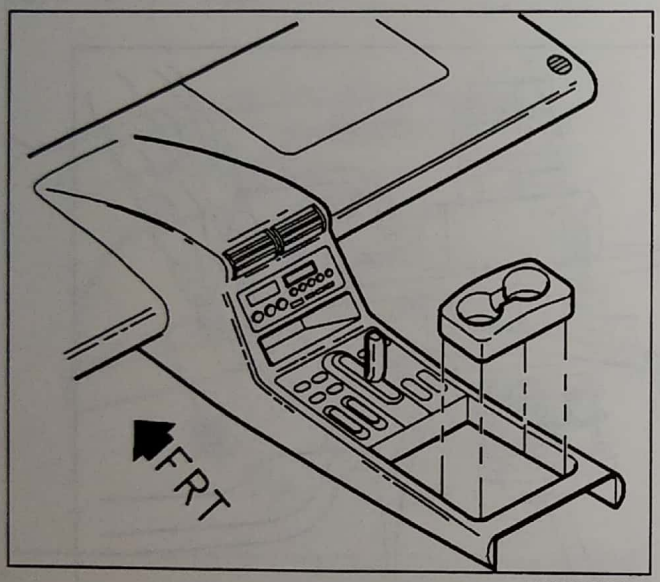
47. Verify shift lever is in neutral. Push U-shaped collar into lock position. Collar will move to right side of vehicle.
48. By hand shift park/lock lever to the full counterclockwise position (DRIVE) then move one detent in the clockwise direction (NEUTRAL).
49. Install underbody front air deflector assembly. (Refer to "Underbody Front Air Deflector Assembly" in the "Body/Repair Service Manual.")

NOTICE: If shift cable has been removed more than six times at either end, for any reason, the cable must be replaced.



PSMMS65734AA

50. Install cup holder to center console.
51. Enable the SIR system. (Refer to "Enabling the SIR System" in this service manual.)

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SENSING AND DIAGNOSTIC MODULE (SDM)

CAUTION: DURING SERVICE PROCEDURES, BE VERY CAREFUL WHEN HANDLING THE SENSING AND DIAGNOSTIC MODULE (SDM). NEVER STRIKE OR JAR THE SDM. NEVER POWER UP THE SIR SYSTEM WHEN THE SDM IS NOT RIGIDLY ATTACHED TO THE VEHICLE. ALL SDM AND MOUNTING BRACKET FASTENERS MUST BE CAREFULLY TORQUED AND THE ARROW MUST BE POINTING TOWARD THE FRONT OF THE VEHICLE TO ENSURE PROPER OPERATION OF THE SIR SYSTEM. THE SDM COULD BE ACTIVATED WHEN POWERED WHILE NOT RIGIDLY ATTACHED TO THE VEHICLE WHICH COULD CAUSE DEPLOYMENT AND RESULT IN PERSONAL INJURY.

CAUTION: PROPER OPERATION OF THE SIR SYSTEM REQUIRES THAT ANY REPAIRS TO THE VEHICLE STRUCTURE RETURN IT TO ITS ORIGINAL PRODUCTION CONFIGURATION. DEPLOYMENT (CURRENT CODE 51 OR 53) OR ANY VISIBLE DAMAGE TO THE SDM REQUIRES REPLACEMENT, NOT REPAIR. PROPER OPERATION OF A SDM ALSO REQUIRES THAT THE SDM BE RIGIDLY BOLTED TO THE VEHICLE. FAILURE TO OBSERVE THESE PRECAUTIONS CAN RESULT IN IMPROPER SIR SYSTEM OPERATION AND POSSIBLE LACK OF SUPPLEMENTAL RESTRAINT PROTECTION DURING AN ACCIDENT IMPACT.

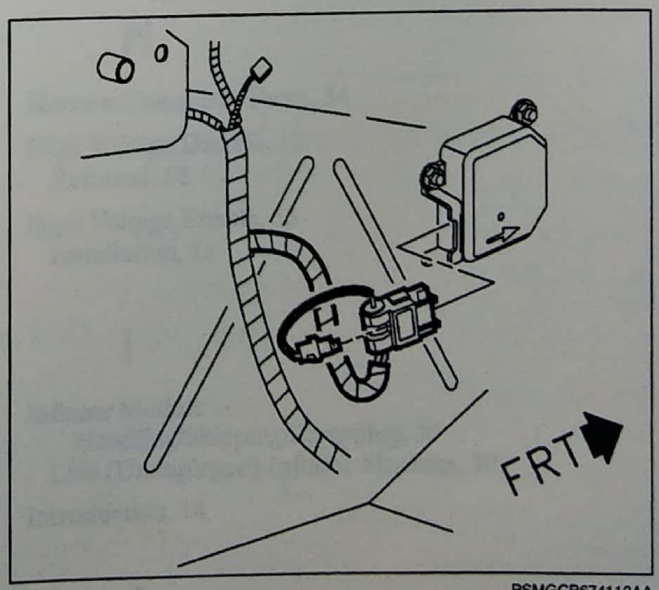
IMPORTANT: In the event deployment has occurred, inspect coil assembly wire for any signs of scorching, melting or other damage due to excessive heat. If the coil has been damaged, it must be replaced.

NOTICE: If a SDM is dropped or shows any signs of damage, replace SDM.

NOTICE: Prior to removal of the SDM, the key pad must be in the LOCK mode for 10 minutes. (Refer to "Disabling and Enabling Precautions" in this manual.)

REMOVAL

1. Place key pad in the LOCK mode.
2. Disable the SIR system. (Refer to "Disabling the SIR System" in this manual.)
3. Pull back carpeting on the RH side of battery pack tunnel, up near I/P.
4. Remove connector positive assurance (CPA) from connector body and disconnect connector from SDM.
5. Remove the three fasteners that retain the SDM module and remove SDM module.



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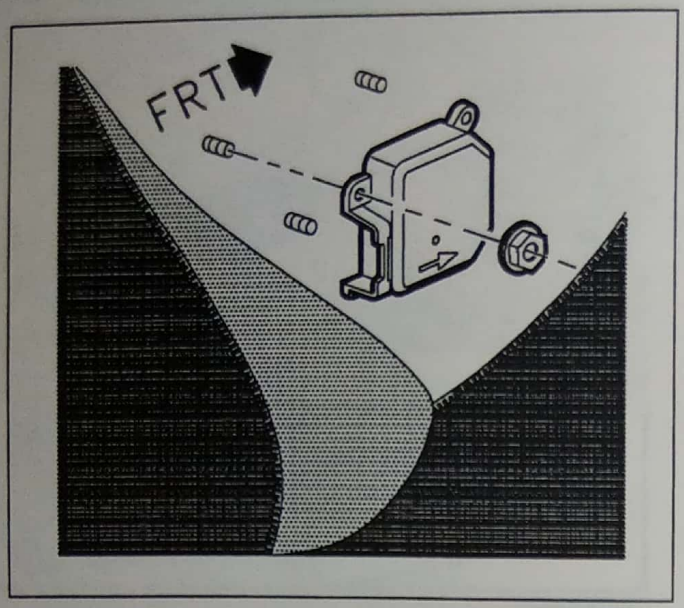

PSMGCP65729AA

INSTALLATION

1. Check SDM mounting studs for corrosion and integrity to ensure proper grounding.
2. Install SDM to battery pack tunnel with arrow in the forward direction and torque.

Torque: 10 N·m (89 in−lbs)

3. Connect SDM connector and install connector positive assurance (CPA).
4. Place carpet over SDM and press firmly on the surrounding edges of carpet to secure Velcro®.
5. Place key pad in the RUN mode and verify the AIR BAG telltale lamp flashes seven times during bulb check and then goes OFF. If telltale does not operate as described above, perform the "SIR Diagnostic System Check" in this manual.

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EV1™ SERVICE MANUAL COMMENT FORM

Use this form if you have any suggestions or see any areas of opportunity for Electric Vehicle Service Manuals.

Service Manual(s) that apply _____

Page number(s) that apply _____

VIN (if applicable) or model and applicable options _____

_____

Describe in detail, the error found or the suggestion(s). Attach additional pages if necessary.

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Service Manual Contents

Diagnostic Trouble Codes (DTCs) and Service Procedures for:

- SIR Diagnosis
- SIR Service Proceedures

NOTE: **Refer to the Index in the back of this manual or the Table of Contents in the front of this manual for location of specific component.**

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